



"I'll wait for the Mac version."

—Dilbert on Win 95, via Scott Adams, creator of the popular comic strip character

"When [Microsoft] users realize what they're really getting vs. what they've been promised, we'll be there for them with... OS/2 Warp."

—Lee Reiswig, general manager, IBM Personal Software Products



"Everything that can be said about Win 95 has been said... The Win 95 user interface is not nearly as good as the Mac. Blah, blah. It has all been said a thousand times."

—Larry Ellison, CEO, Oracle Corp.



"To think that a software release is an historical event is indicative of the fact that some of these people need to get real lives."

—H. P. Newquist, author of "The Brain Makers: Genius, Ego and Greed in the Quest for Machines that Think"



The Newspaper of Information Systems Management
August 28, 1995, Vol. 29, No. 35, 176 Pages, \$6/Copy, \$48/Year

COMPUTERWORLD

Win 95 off and running

The party's over: When will the migration begin?

By Stuart J. Johnston

Finally!

The wait for Windows 95 to ship is over, although the hype hasn't abated a bit.

Microsoft Corp. Chairman Bill Gates was joined on stage by comedian Jay Leno last Thursday inside a gigantic tent on the company's Redmond, Wash., campus.

The gala launch celebrated the commercial availability of the 32-bit operating system, which effectively does away with MS-DOS and finally gives Windows features comparable to the Macintosh.

Retail sales of Windows 95 began at

midnight last Wednesday, with many computer stores staying open late to accommodate potential buyers. Some even held events of their own to build on the frenzy surrounding the system.

Gates said Microsoft has commitments for more than 300,000 Windows 95 units from a laundry list of corporations.

On the list are AT&T Global Information Solutions, Columbia/HCA Healthcare Corp., Deloitte & Touche, The Dow Chemical Co., Ford Motor Co., NASA's Johnson Space Flight Center, Owens-Corning Fiberglass Corp., Saturn Corp., Siemens, Inc. and Union Carbide Corp.

Migration, page 123

Microsoft zips lips of help desk partners about calls

By Julia King
and Tim Ouellette
SEATTLE

Microsoft Corp. says, "Jump!" and its launch partners ask, "How high?"

That much was obvious last week about the relationship between the software giant and the vendor partners looking to make big bucks from the release of the Windows 95 operating system.

Microsoft imposed what

Off peak

Between midnight on Aug. 23 and 9 a.m. Aug. 24, Microsoft said it received 2,500 calls for help from Windows 95 users. That number is much lower than Microsoft expects to handle at peak times, said Deborah Willingham, vice president of Windows 95 support.

amounted to a gag order on third-party support providers, further tightening its grip on the Windows 95 marketplace.

And the company's long arm of control also kept a headlock on some computer retailers across the country. At a Computer City store in Framingham, Mass., employees were specifically told to keep quiet about Windows 95 sales figures, according to salespeople and

Microsoft, page 14

Cabletron gets versatile

More LAN switching for less

By Bob Wallace

Cabletron Systems, Inc. will soon announce Ethernet and Fiber Distributed Data Interface switching modules that analysts said will give users the industry's most versatile LAN switching system.

According to Cabletron documents obtained last week by *Computerworld*, the company will formally announce the products before the Network/Interop '95 conference next month. It will ship them by year's end, company officials confirmed.

The devices are based on the internetworking giant's new Fast Packet Switch application-

specific integrated circuit, or ASIC, which dramatically boosts performance of the MMAC and MMAC-Plus switching hubs.

In addition to giving users that performance boost, the Cabletron switches will support much more LAN switching at lower costs. The new, higher-performance LAN switching modules will cost roughly the same as the older models, a strategy that is a big hit with Cabletron users.

Price down, performance up

"The ASIC technology is driving the price of interfaces down, which means the cost per port of Ethernet switching is dropping," said Peter Pollack, vice president of new technology and architecture at the information services arm of

cable movie channel Showtime in New York. "That's great news when coupled with the serious boost in switch performance."

The vendor also plans to use the ASIC Cabletron, page 16

Will Win 95 kill OS/2?



YES! says
J. Briscoe Stephens

Sound OFF!

See
In Depth
page 97



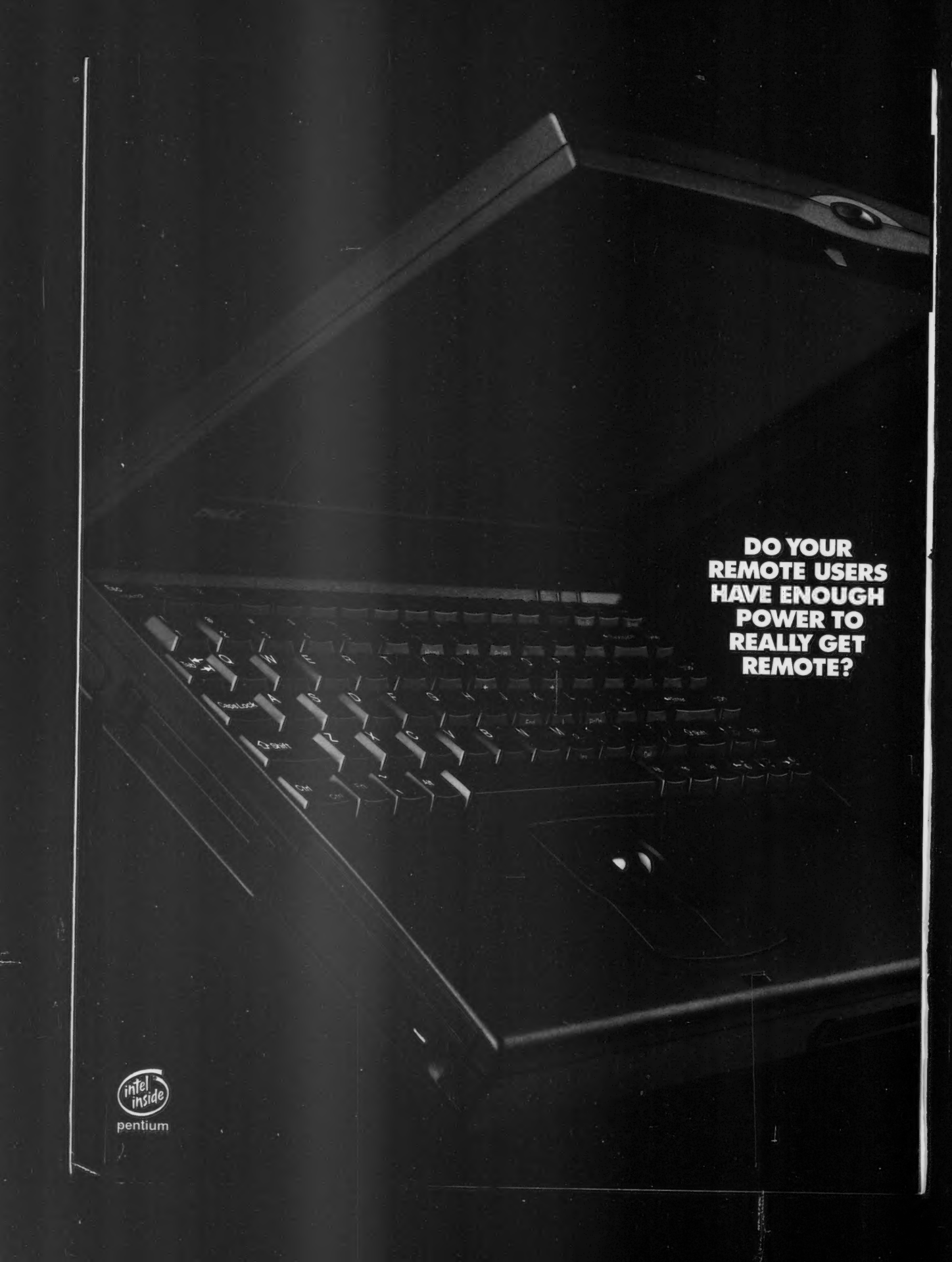
NO! says
Mike Anzies

More on Windows 95 inside:

- The coast-to-coast launch hit fever pitch last week, page 12
- Everybody's a comedian! A humor sampling from the 'net and beyond, page 12
- "Been there, done that" — the rallying cry of Mac users, page 14
- Windows 95 migration poses backup hazards, page 24
- Users lay the hardware groundwork for upgrading (page 43) and our reviewer scopes out installation ups and downs, page 44

Newspaper

#BXBJFT***** 5-DIGIT 48103
#UIU7ZE300M099039# 001011550
UNIVERSITY MICROFILMS INT * 0016
UNIVERSITY MICROFILMS INT 0011 6 XC
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1553



**DO YOUR
REMOTE USERS
HAVE ENOUGH
POWER TO
REALLY GET
REMOTE?**



DELL LATITUDE
Dependable Notebooks
With Superior Battery Life

**GIVE THEM
THIS MUCH
BATTERY LIFE
IN A PENTIUM
PROCESSOR
NOTEBOOK.**



DELL LATITUDE XPi

90MHz PENTIUM PROCESSOR

- 10.4" Active Matrix Color Display
- 16MB RAM
- 12GB Removable Hard Drive
- 3 Year Extended Warranty

\$5999 Product Code #600115

Single unit promotional price.

DELL LATITUDE XPi

75MHz PENTIUM PROCESSOR

- 10.4" Active Matrix Color Display
- 16MB RAM
- 810MB Removable Hard Drive
- 3 Year Extended Warranty

\$4899 Product Code #600106

DELL LATITUDE XPi

75MHz PENTIUM PROCESSOR

- 10.4" Dual Scan Color Display
- 16MB RAM
- 524MB Removable Hard Drive
- 3 Year Extended Warranty

\$3699 Product Code #600105

Single unit promotional price.



Our XPi is based on the same proven design that won the Industrial Design Excellence Award. Plus, it's the only notebook to receive a "Best Overall" in *PC Computing's* "Torture Test" competition.

Its removable hard drive makes it easy to upgrade and service your notebook no matter where you happen to be.

Next-business-day, out-in-the-field service and support,* standard with every notebook, so you can keep going as long as our batteries. A Dell exclusive.

Big battery life in a Pentium processor notebook, four hours and forty minutes to be exact, as proven in the independent VeriTest "Cross-Country"™ test.*

Our smart Lithium Ion battery has an embedded microprocessor that allows each individual cell to recharge quickly and to full capacity.

Superior power management via an exclusive Dell design that optimizes power consumption based on individual component needs.

Less power consumption thanks to the use of Intel's LM Pentium chip which was designed specifically for use in notebooks.

DELL

(800) 626-9534

Keycode #12057

*The VeriTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® v3.11 during an airplane flight. Power management was enabled and 8MB of RAM was installed in a Latitude XPi P750. VeriTest, Inc. is located in Santa Monica, CA. Actual battery life will vary depending on nature of use and configuration. For a complete copy of our Limited Warranties, please write to Dell USA L.P., 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758. Prices and specifications valid in the U.S. only and subject to change without notice. *On-site service provided by BancTec Service Corp. and may not be available in certain remote locations. Pentium and the Pentium processor logo are registered trademarks of Intel Corporation. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. ©1995 Dell Computer Corporation. All rights reserved.

Designed for



News

- 2 Mainframe price war?**
IBM's new air-cooled mainframes will see some competition next week when Amdahl begins marketing a rival family.
- 4 Routing software**
New software centrally manages diverse routers, switches and carrier services that also build complex WANs.
- 6 Handheld computers**
New PDAs are arriving this fall — and they may even be useful, analysts say.
- 8 PC price tag twist**
PC prices may be in a free fall right now, but users are actually spending more money on hardware than ever before.
- 10 Client/server mainframes**
IBM plans later this year to start making the mainframe a more complete participant in client/server networks based on the Distributed Computing Environment.
- 12 Win 95 humor**
"A good software product is kind of like a good date — smart, friendly... and under \$100," comedian Jay Leno quipped. That and other Windows 95 jokes were making the rounds last week.
- 14 Apple's response**
Apple struggles to be heard over the Windows 95 hype.
- 15 A new kind of ATM**
MFS Datanet is the first company to offer users voice and data over variable bit rate ATM.
- 16 Air traffic control**
Northwest Airlines charges American Airlines with computerized reservation system bias.
- 20 Cisco enhancements**
Cisco details new features for its router software in the areas of security and policy-based routing.

OPINION

- 37 CD-ROM backlash**
David Michael Bernard warns that data on glitzy CD-ROMs is no more accurate than that in old-fashioned books.
- 37 Windows 95**
Max D. Hopper says Windows 95 won't win top honors in the IT hall of fame.

Rich Tennant's "The 5th Wave" is on vacation and will be moving to another location in Computerworld. We'll keep you posted.



JACKE BUSTMAN

Choice Cuts

Client/server financial software is moving the earth: Analysts say the market will soar to \$3.7 billion in 1999. But there are some settling cracks to contend with.
CW Guide, page 88.



The dual faces of Internet security: Steve Moore argues that Big Brother is lurking on the 'net, while Gary H. Anthes contends that all is secure. Enterprise Networking, page 59.

Technical Sections

- DESKTOP COMPUTING**
- 43 Hardware upgrades**
Some users are laying the hardware groundwork to upgrade to Windows 95.
- WORKGROUP COMPUTING**
- 53 PC management**
The Desktop Management Interface standard is extended to include remote computers.
- 54 Faxing woes**
Despite the hype about getting information to users' desktops, in-bound routing for faxes remains a far-from-perfect technology. It's complex and requires too much user participation.



ENTERPRISE NETWORKING

- 59 IBM gateway**
IBM closes in on taking over development and support for a NetWare-to-host gateway. Novell will continue to market it.
- 60 The Internet Page**
AT&T announces plans for comprehensive Internet services, but details remain sketchy.
- LARGE SYSTEMS**
- 69 Client/server migration**
IBM is developing bridges between its MQSeries messaging middleware and mainframe-based transaction processing applications.
- 73 SMP**
Data General unveils a high-end server based on an emerging architecture that allows the boxes to scale up to 32 processors.



APPLICATION DEVELOPMENT

- 75 Internet development**
Object-oriented tool maker Next Computer unveils plans for Web development tools.
- 76 Objects for Win 95**
New object-oriented development tools take advantage of Windows 95.

Features

MANAGEMENT

- 81 Avoiding layoffs**
Managers in Europe and Japan are finding novel approaches to avoiding mass layoffs but no surefire cure.

CAREERS

- 103 Opting out, cashing in**
The majority of independent IS contractors make more than \$65 per hour, according to a recent survey. So how can you cash in on this growing field?

MARKETPLACE

- 114 Financial software**
Getting 100% of financial processing onto a client/server system is at least two years away for most companies. Meanwhile, companies must decide between stand-alone, best-of-breed products and an integrated package.

Etc.

Calendar	84
Company Index	120
Editorial/Letters	36,40
Inside Lines	124
Aug. 25 Stock Ticker	121
How to contact CW	120

Coming next week: The 9th annual Computerworld Salary Survey



IS salaries have increased an average of 4.5%, while other professions average 3%. That's good news, but women are still vastly outnumbered in upper management jobs.

Amdahl to heat up air-cooled market

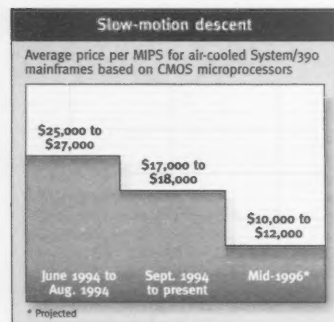
Competition for IBM should lower costs, but shipments won't start until mid-1996

By Craig Stedman

IBM's new generation of air-cooled mainframes will start losing their lone wolf status next week when Amdahl Corp. begins marketing a rival family. The promise of some honest competition should mean further price relief for System/390 shops, although Amdahl's machines won't ship until mid-1996.

For now, customers can turn to only IBM to get the latest — and cheapest — mainframe technology based on low-cost CMOS micropro-

cessors. While IBM's air-cooled 9672 R models sell for less than traditional ES/9000s, the lack of air-cooled alternatives has enabled the company to hold the line on pricing for the past year.



cessors. While IBM's air-cooled 9672 R models sell for less than traditional ES/9000s, the lack of air-cooled alternatives has enabled the company to hold the line on pricing for the past year.

"If I want to bring in CMOS today, I only have one option, and IBM is making a huge profit margin," said Dale Perry, director of technology architectures at Bell Sygma, Inc. in Toronto.

Perry and other mainframe buyers said they expect Amdahl's systems to force IBM out of its pricing shell. Hitachi Data Systems Corp. is also planning to ship a line of air-cooled machines next year, using IBM's CMOS technology under a licensing deal signed last year by par-

ent company Hitachi Ltd. Analysts predicted that the presence of Amdahl and HDS could help push air-cooled pricing down by a third or more from its current perch of up to \$18,000 per MIPS (see chart).

Amdahl is telling customers it expects to have a performance edge over both IBM and HDS, "and that may be the key to success for them," Perry said. Bell Sygma has a mix of mainframes from all three vendors and will "most definitely" look at each of the air-cooled offerings, he said.

Amdahl declined to comment on its plans, but sources briefed by the company said it will promise performance of 45 to 48 MIPS for its CMOS-based processors, which are being developed by parent company Fujitsu, Inc. Rob Schafer, an analyst at Meta Group, Inc. in Stamford, Conn., said he expects IBM to hit about 43 MIPS with the third version of the 9672 R, which is also due in mid-1996.

Amdahl will support up to eight processors in a single box, two fewer than IBM can squeeze into a 9672 R, Schafer said. While that puts Amdahl at an overall performance disadvantage, it will mitigate the impact by supporting IBM's technology for coupling multiple System/390s together into so-called "sysplex" clusters that can function as a single machine, he added.

Discount dilemma

However, one disadvantage that may be harder to overcome is IBM's ability to offer discounted package deals combining the 9672 R hardware with MVS and its other mainframe software.

While IBM has always been able to offer such discounts on the side, it created overt 9672 R packages that are used for most purchases of the machines, said Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn. Since Amdahl and HDS lack their own software products, beating IBM on pricing "is not going to be an easy deal for them," Burns said.

Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Missouri, said he expects to stick with IBM as his supplier for the air-cooled machines.

But the arrival of Amdahl and HDS will still be good news, Pattison added. "They'll drive the price down, and IBM will have to come down with them. I'll be glad to take advantage of it."

ATM light goes on at Bay: Hub, router first targets

By Bob Wallace

Bay Networks, Inc. next month will detail long-awaited wares and enhancements to its product lineup that will let users gradually migrate to backbone networks based on Asynchronous Transfer Mode (ATM). *Computerworld* has learned.

Bay plans to shore up its System 5000 switching hub with an ATM interface in its first detailed technology direction blueprint since the company was formed from the merger of Wellfleet Communications, Inc. and SynOptics Communications, Inc. last year.

Bay sources, who requested anonymity, said the upcoming announcements signal how the System 5000 will be positioned as a full-blown "virtual network backbone routing switch" by 1997. A Bay spokesman confirmed plans for the strategy announcement but would not comment further.

The September announcement will include other improvements that will enable the System 5000 to anchor an ATM-based LAN switching backbone and support LAN protocols over ATM networks.

Users said these announcements will come not a moment too soon.

"I've been looking at the System 5000 for quite a while now and have been waiting for their grand ATM plan since the merged company was launched,"

said Bill Horst, a chief at the General Services Administration's communications branch in Philadelphia. "I've wanted to see which of the items that the ATM Forum is working on that they planned to support in their products."

The ATM Forum, a large industry association, and Bay are both working on schemes for an ATM capability called Private Network-to-Network Interface (PNNI), virtual LAN routing and Multiprotocol-over-ATM (MPOA).

Bay is separately prepping the ATM interface for the System 5000, and it is planning to later add ATM-based LAN switching to

the switching hub.

ATM functionality will position the System 5000 as a strong competitor to switches from Cabletron Systems, Inc. and 3Com Corp., said one source briefed by Bay on the planned announcement. "This will make Bay Networks a serious player in ATM [switching]."

The enhancements to the System 5000 will include ATM-based

Bay Networks details ATM strategy

The switch maker is prepping the following products and capabilities:

ATM INTERFACE FOR THE SYSTEM 5000

ATM-BASED LAN SWITCHING FOR THE SYSTEM 5000 (ETHERNET AND TOKEN RING)

VIRTUAL LAN ROUTING FOR THE SYSTEM 5000 AND BACKBONE NODE (BN) ROUTER

INTEGRATED PRIVATE NETWORK-TO-NETWORK INTERFACE FOR THE SYSTEM 5000 AND BN

MULTIPROTOCOL-OVER-ATM SUPPORT FOR THE SYSTEM 5000 AND OTHER PRODUCTS

Ethernet and Token Ring LAN switching, the latter coming from Bay's acquisition of Token Ring switching pioneer and start-up Centillion Networks, Inc., sources said.

"I've been looking at the System 5000 for quite a while now and have been waiting for their grand ATM plan since the merged company was launched."

— Bill Horst, chief, General Services Administration

The System 5000 will also support what Bay calls Integrated Private Network-to-Network Interface (I-PNNI), a spin on a specification that the ATM Forum is developing. The Forum's specification would let routers and switches pass routing data across an ATM internetwork.

But with I-PNNI, Bay devices could have more capabilities over and above those specified by the ATM Forum.

The Bay devices, for example, could select optimal paths through networks and offer quality-of-service-based routing.

Bay will also eventually build virtual LAN routing capabilities into the System 5000. Virtual LANs are logical rather than physical networks. The System 5000 would be able to support multiple virtual LANs and route between them, sources said.

The vendor also plans support for MPOA, a means for running Novell, Inc.'s IPX and IP between devices in ATM networks, sources said.

Cisco lifts curtain on high-end routers

By Bob Wallace

Cisco Systems, Inc. last week formally announced the details — architecture, pricing and availability — for its three-model, next-generation 7500 high-end routers.

Cisco will offer the 7505, 7507 and 7513 models, which have five, seven and 13 slots respectively. The new 7500 units use the vendor's Internetworking Operating Software, which supports all major protocols (CW, Aug. 21).

The 7500s integrate routing and switching on a single processor, which frees up slots for interfaces. The company said the new Versatile Interface Processor (VIP) takes that one step

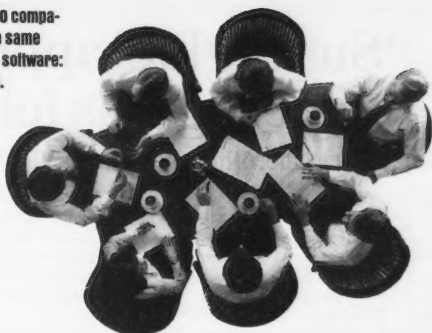
further by supporting multiple interfaces on one card.

Base pricing for the 7505, 7507 and 7513 starts at \$10,900, \$19,900 and \$28,900 respectively.

All models are available now. Software options cost \$4,000 to \$8,000.

Cisco offers a VIP that supports four Ethernet links and one 100Base-T "fast" Ethernet link for \$17,000; a model that supports two "fast" Ethernet links for \$16,000; a unit that supports one "fast" Ethernet link for \$12,000; and a VIP with four Ethernet and four serial links for \$17,000. All will ship in the fourth quarter.

98% of the Fortune 500 companies have reached the same decision on business software: Computer Associates.



One click connects you to the only financial software with proven client/server technology. CA-Masterpiece/2000.



From accounting clerks to your executive work force, Masterpiece makes everyone more productive. With a graphical interface that's simply the easiest thing you've ever seen.



Masterpiece is multi-currency, multi-language and multi-company. So you can consolidate financials from around the world.



Multi-dimensional modeling
Multi-platform GUI client/server tool
Query and reporting tools
Mission-critical Industrial-strength



CA90s is the truly open architecture that lets Masterpiece cross virtually every major platform and operating system.

Introducing The Only Financial Software That Can Produce These Statements.

We couldn't make that kind of statement unless CA-Masterpiece/2000 could back it up. And it can. Thanks to a new breed of client/server financial software that delivers on everything you've been waiting for.

Proven client/server technology. Distributed and cooperative processing. UNIX. Windows. A common user interface. Open architecture. SQL. WYSIWYG. And multi-dimensional modeling.

But Masterpiece is not merely about stunning technology. It's about the benefits that technology provides. Real-time data access. Advanced

decision-support tools. Global capabilities. More timely and accurate data. And increased work force productivity. Together, it all adds up to greatly lower costs for your business.

**For More Information And A Free Booklet,
Call 1-800-225-5224, Dept. 51102.**

We'll show you even more reasons why; in financial software, Masterpiece is the best place to put your money.



COMPUTER ASSOCIATES
Software superior by design.

CA-Masterpiece/2000
Client/Server Financial Software

© Computer Associates International, Inc., Ithaca, NY 14850-7000.
All other product names referenced herein are trademarks of their respective companies.

Firm adds spark to WAN manager

StonyBrook tool handles routers, switches, services

By Patrick Dryden

To help administrators maintain increasingly complex wide-area networks, router management specialist StonyBrook Software last week introduced more versatile software.

Called RouterManager/AutoBahn, the Windows-based WAN manager provides a single console for configuring and monitoring not only routers and bridges from diverse vendors but also internetwork

Wide-area networks

switches and connection services. These capabilities make the tool a significant alternative to the many individual pieces needed to manage multivendor WANs or complex and costly Unix-based management platforms, said Tim Wilson, a management analyst at Decisis, Inc., a consultancy in Herndon, Va.

"AutoBahn offers a holistic view of the backbone that you can't get from individual element managers," Wilson said. "The live view lets you see the topology of all routers, switches and internetwork links at once."

Typically, administrators rely on an enterprise network management platform to integrate the myriad tools from vendors via the Simple Network Management Protocol. StonyBrook's option won't compete with such a core platform but will serve a niche purpose as a WAN topology manager, Wilson said.

High praise

Beta testers said RouterManager/AutoBahn met their needs for managing the configuration, performance and faults of their large networks. They specifically praised the Windows-based software for its simplicity.

"AutoBahn installed quickly and easily on a PC and leveraged our Windows skills, so we could do more value-added management tasks than sit around and muck with the tools," said Rick Sangha, telecommunications manager at Allegheny Ludlum Corp. in Pittsburgh.

Sangha said his former Unix-based management tool set required a considerable amount of time and money for initial training plus an exorbitant amount of administrative overhead. "We had to hire rocket scientists to make it all work and to provide constant attention," he said. "AutoBahn is easier to use, so the

old tools just sit in the corner."

StonyBrook's RouterManager applications integrate well on a Windows platform with other tools, such as the network management services from Novell, Inc., according to Clem Bowen, systems programmer at Buck Consultants, Inc., a

Window into WAN management

STONYBROOK SOFTWARE'S
ROUTERMANAGER/AUTOBAHN

DESCRIPTION: A single console that configures and monitors WAN elements from diverse vendors.

ROUTERS/BRIDGES/SWITCHES: Manages units and software from 3Com, Bay Networks, Cisco, Digital, Novell and others.

SERVICES: Manages packet-switching technologies, including X.25, frame-relay and Switched Multimegabit Data Service; support coming for ISDN.

REQUIREMENTS: Windows-based PC with at least a 486 CPU, 20M-byte hard disk and 8M bytes of memory. Windows NT recommended.

STATUS: Available now

PRICE: \$1,995 plus agents

New York-based benefits consulting company. "Their software is easy to use, with no learning curve, and has the functionality of [Cisco Systems, Inc. router manager] CiscoWorks, so it's cost-effective," he said.

Problem detection

Bowen tested the AutoBahn version to be able to monitor the frame-relay connections among 18 of the company's 30 routed sites. Another valuable feature is the ability to test and trace the path a packet takes from source to destination, he said.

RouterManager/AutoBahn can help manage packet-switching technologies including X.25, frame-relay and Switched Multimegabit Data Service (SMDS).

"Now WAN managers can prove to a carrier where a problem lies," said Ravi Gulati, president of StonyBrook in Bohemia, N.Y. Besides supporting the generic and private management extensions of both hardware and software routers, the package can manage Ethernet, Token Ring and Fiber Distributed Data Interface switches and their router interfaces, Gulati said.

RouterManager/AutoBahn can run on all Windows versions, but StonyBrook recommends Microsoft Corp.'s Windows NT platform.

Pricing starts at \$1,995 for the basic application plus agent modules.

'Superglue' approach to objects gains followers

IBM, Oracle, others sign up for Visual Edge software

By Elizabeth Heichler

A small company has created technology that might serve as superglue for the fragmented world of distributed object-oriented computing.

IBM, Oracle Corp. and Taligent, Inc. are among the companies that announced last week that they will license Visual Edge Software Ltd.'s Object Bridge, which promises to permit interoperability among all the disparate object models on the market.

Several of the object models available are based on the Object Management Group's Common Object Request Broker Architecture specification, as well as Microsoft Corp.'s Component Object Model (COM). All offer slightly different ways of defining how objects communicate with each other, which makes interoperability between them difficult.

Interest piqued

Bankers Trust Co. in New York is evaluating the technology from Saint-Laurent, Quebec-based Visual Edge, according to Joe Schwartz, senior consultant in software engineering at the bank's Advanced Technology Consulting group.

"We're interested in distributed object technology," Schwartz said. And the company also wants to have the flexibility to deploy systems that use a mix of object models, he added.

Because Bankers Trust uses Windows on desktop systems, it needs to enable communication between COM on the client side and different object request brokers (ORB) on the back end, Schwartz explained.

"Our key goal from an applications development perspective is to build an ob-

ject once and deploy it over a heterogeneous environment," Schwartz said. "Object Bridge promises to help us achieve that goal. We think that the architectural foundation represents an important approach to object system translation."

Schwartz and other observers said Visual Edge's technical approach is different from, and superior to, that taken by some of the object system vendors that do offer some level of interoperability between their ORBs and COM, for example.

"This is one of the better designed interoperability options," said Melinda Ballou, an analyst at Meta Group, Inc. in Stamford, Conn. Other solutions, from individual ORB vendors, don't offer the same level of flexibility, she explained.

Ballou added that another advantage of the Visual Edge solution is that the company is a neutral player in the object market and isn't trying to sell bridge technology in concert with a specific ORB product or object model.

Representatives of Oracle and IBM said they chose to license the Object Bridge technology because it is flexible and can be extended.

This means it will permit information exchange not only among multiple object models but also among object systems and different data types, such as relational databases.

None of the companies is ready to disclose how it will incorporate Object Bridge into future products, nor when the technology will be available to customers.

Object-oriented development tools bow for Windows 95. See page 76.

Don't fence me in

Bankers Trust won't be locked in to using a single object request broker because it hasn't found one that meets the following requirements:

- Fault tolerance
- Transaction services
- Ability to operate in a disconnected state
- System management tools
- Configuration management tools.
- Truly robust, high-performance global name space

Corrections

"SAP AG runs late, but users give high marks" [CW, July 31] indicated that SAP AG had slipped on its initial July delivery date for Release 3.0 of its R/3 software. SAP subsequently said it did ship a limited number of R/3 systems in July under its first customer shipment program. Release 3.0 will be available generally by the end of the year, as originally planned, the company said.

Due to an editing error, a photo labeled TeamTalk that ran with "Prod-

ucts with discussion databases" [CW, July 31] should have read FirstClass by SoftArc, Inc. in Markham, Ontario.

Due to a reporting error, "New York eases taxes to create multimedia mecca" [CW, Aug. 14] incorrectly stated that N2K, Inc. sells an interactive CD-ROM-based jazz catalog called Jazz Central Station for record label GRP. Rather, N2K is launching Jazz Central Station, an on-line multimedia connection for the jazz community on The Microsoft Network.

Putting data into a warehouse is one thing. Getting it back out, however, is a different story.

You want fast answers from your data warehouse. The faster you can find them, the faster you reach decisions. And the bigger your jump on your competition.

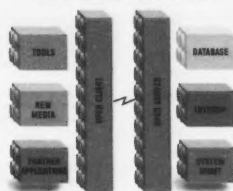
FAST ANSWERS TO AD-HOC QUERIES. The Meta Group says almost half your queries will be "random, probing questions that cannot be predicted in advance." Why choose, then, a solution that requires staff to tune each and every one?

Here's what our customer, Dun & Bradstreet Software, has to say: "Sybase gives our users the flexibility and performance they need to gain immediate answers to their business questions."

INNOVATIVE BIT-WISE™ INDEXING TECHNOLOGY. IQ Accelerator™ boosts query performance 10 to 100 times faster



THE SYBASE ENTERPRISE
CLIENT/SERVER ARCHITECTURE



DATA WAREHOUSING

THE SYBASE® WAREHOUSE WORKS™
LINE OF PRODUCTS IS DESIGNED TO
WORK TOGETHER—AS WELL AS WITH
YOUR EXISTING TECHNOLOGY.

WHICH IS WHY SYBASE IS THE
LEADING MIDDLEWARE PROVIDER
FOR DATA WAREHOUSING SOLUTIONS.*

than today's technology—without adding hardware like parallel systems. It efficiently indexes all data, providing a complete map of your vital business information and eliminating costly, time-consuming table scans.

A PROCESS, NOT A PRODUCT. At Sybase, we view data warehousing as a process: assembling data, transforming, distributing and accessing it.

With our comprehensive Warehouse WORKS line of products, you can do all this and manage the process, in an open architecture that grows with you.

TO LEARN MORE, CALL US AT 1-800-SYBASE-1 EXT. 1882. Or visit us on the Internet at <http://www.sybase.com/>. We'll get you the answers you need. Without any digging.

 **SYBASE®**
The Architecture for Change™

PDAs: Better and cheaper?

Poor sales prompt vendors to respond to users' need for better connectivity

By Mindy Blodgett

The troubled personal digital assistant (PDA) market has proved disappointing even for those vendors braced for the worst, but industry observers say several PDA manufacturers are pressing ahead with new and improved products due this fall.

The forthcoming PDAs are likely to be several hundred dollars cheaper, costing \$500 or less. More important, the next generation of PDAs will more closely meet users' need for connectivity, according to observers.

"You should be seeing cheaper PDAs with many more features," said Timothy Schmidt, an analyst at Encore Consulting Group in Orlando, Fla. "And you should be seeing more interesting software written to PDAs, for instance, providing such things as links to Lotus Notes."

Sources said Hewlett-Packard Co. will release a PDA this fall based on the Geoworks Geos operating system. HP had hoped to release a PDA costing as little as \$300, but sources said the device will likely cost about \$500. HP's 200LX handheld device costs \$549 to \$699.

The high prices of PDAs haven't helped the market, analysts said. Motorola, Inc.'s two wireless devices, Envoy and Marco, cost \$900 to \$1,500. Sony has already dropped the price of its Magic Link PDA from \$699 to \$499.

Andrew Seybold, editor of "Andrew Seybold's Outlook on Communication and Computing" in Boulder Creek, Calif., said several unnamed vendors plan to release devices this fall. He said the new PDAs will be true "extensions of the desktop."

Better with age

When PDAs first hit the market, they were derided by many as electronic organizers, so features that appeal to executives were added. For instance, Marco and Envoy offer an Internet electronic-mail capability via RadioMail on the ARDIS Co. wireless radio network. But users want access via their own network systems, according to analysts.

"The PDA will be a very good device once it really communicates back to the user's own desktop," Seybold said. "Surveys have shown that people want a handheld computer with the ability to get them their own E-mail and their own files."

To move ahead, the PDA market needs software that provides applications such as improved connectivity, industry observers said.

In other PDA-related news, Motorola, Inc.'s Microprocessor and Memory Technologies Group in Austin, Texas, last week announced a microprocessor for portable handheld devices. Motorola claims the integrated chip should lead to less expensive PDAs because several functions are included in one chip.

— Senior writer Jaikumar Vijayan contributed to this report.



Notebook prices slipping down

Compaq unwraps Pentium portable while Digital, HP slash prices

By Mindy Blodgett
and Jaikumar Vijayan

Compaq Computer Corp. last week unveiled its long-awaited, high-end Pentium notebook just as a handful of competitors dropped their prices.

But a price war is not imminent, industry observers say.

Houston-based Compaq released its LTE Elite 5000, which will begin shipping by the end of next month. The LTE Elite 5000 is a full-featured multimedia notebook with up to 2.7G bytes of internal storage, up to 72M bytes of RAM and support for two batteries. Pricing is not yet available. Other features in-

ments to the market or from the companies clearing out inventory to make way for new products. Neither company is a strong enough player in portables to spark a price war, analysts added.

Last week, Digital cut prices on its notebook computers by 14% to 30%. Prices of Digital's subnotebooks, the HiNote Ultras, will cost \$2,699 to \$3,859. Notebooks in the HiNote family will sell for between \$1,739 and \$2,629.

HP followed up its desktop price cuts with similar cuts on some of its notebook lines. The company last week said it was rolling back prices by up to 19% on its 486-based HP OmniBook 4000 and OmniBook 600 notebooks. For example, an OmniBook 4000C with a 100-MHz 486DX4 chip and 520M-byte hard drive will now have an estimated street price of \$2,500 compared with \$3,064.

"This is competitive postur-

IN DETAIL

Features of the Compaq LTE 5000 notebook:

- Modular design with storage expansion to 5.4G bytes and up to 72M bytes of RAM
- PCI local bus graphics
- Support for two batteries with up to eight hours of battery life
- Option of MPEG full-motion, full-screen video

ing, not a price war," said William Ablondi, an analyst at BIS Strategic Decisions, Inc. in Norwell, Mass.

Still, the pricing action may prompt Armonk, N.Y.-based IBM to cut prices. A spokesman said last week the company would not rule

out cutting prices on its ThinkPad notebooks.

Officials from Dell Computer Corp. in Austin, Texas, said they are content with their level of pricing. The Dell Latitude notebooks cost \$1,999 to \$4,526.

"I think some of the price reductions you are seeing are some companies adjusting to reality," said John Medina, Dell's vice president of portables.

The pricing cuts reflect, in part, that active-matrix color displays are shipping in high volumes from Japan and Korea, pushing prices down. Other component cuts, including cuts in processor pricing, are also sending market prices down.

Remote workers gain telephony features on the PC. See page 64.

Portables: Primary PCs

BIS Strategic Decisions in Norwell, Mass., predicts that by 1998, a majority (51%) of PC users will use portables as their primary PC. By the year 2000, BIS forecasts that number will jump to 80%.

Small potatoes

Meanwhile, analysts said price reductions from Digital Equipment Corp. in Maynard, Mass., and Hewlett-Packard Co. in Palo Alto, Calif., are likely due to readjust-

Digital trolls for PC users with cost lure

Making its bid to stay in a tight PC race, Digital last week said it was slicing the price of its corporate desktop and notebook computers.

Reductions in the price of Digital's Venturis and Celebris GL PCs, which range from 6% to 17%, come shortly after Compaq, IBM and rising player Hewlett-Packard snipped their PC prices. Digital now offers a 75-MHz Intel Corp. Pentium-based Venturis PC for \$1,679, a \$220 cut that brings its pricing more in line with competitors.

What they want

Digital's new prices could be good news for users such as James Grigos, data processing manager at David Clark Co. in Worcester, Mass. The company makes communications headsets. Grigos said he recently switched to lower-priced Gateway 2000, Inc. PCs but would pay a small premium for Digital models in the future because the company offers excellent support and smooth compatibility with his Ethernet-based network.

"We'd like DEC to come back to us in the future [with lower PC prices]. We have to jump through a few hoops

with setting up a Gateway PC," he said.

Digital continues to assert its intention to crack the top tier of PC vendors. Jumping into the price wars with

larger-selling rivals is a must, said Jennifer Munson, an analyst at Workgroup Strategic Services, Inc. in Portsmouth, N.H. The notebook price cuts, meanwhile, signal Digital's readiness to clear its stock before introducing new versions of its HiNote line. The move is another indication of Digital's competitiveness, Munson said.

Digital said its suggested list price for a Pentium-based HiNote model dropped \$310, to \$1,739. The company also sliced 14% off the price of its entry-level HiNote subnotebook, to \$2,669.

The new tag lists for its PCs come on the heels of Digital's unveiling of new PC models. They include Celebris GL, a midrange business

computer that integrates high-performance graphics, audio and networking, and Starion home computers aimed at multimedia users.

— Michael Goldberg and Neal Weinberg

How low can Digital go?

Sample price cuts from Digital include the following:

HiNOTE ULTRA NOTEBOOK				
Model	Memory	Hard drive	Old	New
CS475	8M bytes	510M bytes	\$3,879	\$3,259

HiNOTE NOTEBOOK COMPUTER				
Model	Memory	Hard drive	Old	New
CS475	4M bytes	510M bytes	\$3,039	\$2,249

VENTURIS PC SLIMLINE*			
Model	Processor	Old	New
5100	100 MHz	\$2,499	\$1,999

CELEBRIS GL LOW PROFILE*			
Model	Processor	Old	New
5133	133 MHz	\$4,099	\$3,749

CELEBRIS GL SHORT TOWER*			
Model	Processor	Old	New
5120	120 MHz	\$3,899	\$3,599

*All prices are for 8M bytes of memory and 420M-byte hard drives



Micro Focus® Dialog System™ 3270

What if you could move mouse. With Micro Focus Dialog System's 3270 feature, you can take host- or workstation-based CICS or IMS screens and automatically translate them into Graphical User Interfaces. No C programming or API calls. No changes in business logic. No sweat.

your CICS applications to a GUI

without roughing it?

The result is an interface that's cleaner, easier to use and integrated with other desktop applications. Then, once you've moved your interface logic to the PC, you can modify it or add new functions without impacting the business logic. Dialog System's 3270 feature makes the first step to Client/Server an easy one. It's one of the many tools within Micro Focus Dialog System; a system that gives you rapid development of GUI interfaces and client/server applications with little or no additional programming.

Make sure your computing environment is powerful enough to grow and evolve your enterprise-wide applications. Only Dialog System has all the tools you need to manage the changes in your business without getting in over your head.

See for yourself.

Contact Micro Focus at 800 MFCOBOL Ext. 1203 and ask for your copy of the Micro Focus CD. On it, you'll find descriptions and interactive demonstrations of Micro Focus development tools.



A Better Way of Programming™

MICRO FOCUS®

Micro Focus is a registered trademark. Dialog System and "A better way of programming" are trademarks of Micro Focus Limited.

Dell strategy tackles dormant server sales

By Jaikumar Vijayan

Hard on the heels of what appears to be a fairly successful comeback in the portable computer business, Dell Computer Corp. is now focused on reviving its comatose server business.

According to founder and Chief Executive Officer Michael Dell, the company expects to breathe life into that market sector via a series of moves that include the following:

- Introducing a high-end, quadprocessor database/application server in the near term.
- Strengthening and building strategic alliances between Dell and key partners such as Oracle Corp. and Microsoft Corp. to jointly develop database and Microsoft Windows NT servers tuned for Oracle databases.
- Building and extending on its current partnership with 3Com Corp., particularly in the area of 100Base-T 100M bit/sec. Ethernet technology.
- Developing network and system management products that will snap into industry standard environments such as Hewlett-Packard Co.'s NetView and Intel Corp.'s LAN Desk.



CEO Michael Dell hopes to challenge Compaq, HP and IBM

Analysts estimate that in the near term at least, Dell will try to ride Intel's P6 chip into the server space. The company has already confirmed that it is preparing a four-processor P6 application server based on Intel's motherboard and symmetrical multiprocessor design.

That server is expected to start shipping in the first quarter of next year.

A strong server business will be vital to Dell's continued presence in the corporate market, analysts said. Last quarter, server revenue contributed only 3% to overall revenue of more than \$1.2 billion. Desktop PCs contributed an overwhelming 82% of revenue. That makes Dell one of the few players in the top tier that, despite having a major

corporate PC presence, lacks a significant server presence. That market is dominated by Compaq Computer Corp., HP and IBM. Last year, Dell tried to infuse new life into the business when it recruited Mark Garver, one of the top executives at superserver vendor Tricord Corp., to head up Dell's enterprise effort. But unlike Dell's notebook comeback — portables now account for 15% of Dell's revenue — the server effort has been stumbling along.

Sticker shocker

Despite deals, users are spending more on PCs

By Jaikumar Vijayan

PC prices may be in a freefall right now, but ironically, users are buying more expensive systems than ever before.

Driven by an emerging class of performance-hungry applications and operating systems such as Microsoft Corp.'s Windows 95, users increasingly are buying systems equipped with faster processors, beefed up memory and storage, and added multimedia capabilities.

As a result, the average price of PCs from some major vendors has actually

was \$2,543, while in June it went up to \$2,566.

Although the increase in ASPs seems marginal, it is nonetheless very significant, according to Kurt King, an analyst at Montgomery Securities. "When you are talking about a situation where ASPs tend to remain stable year after year, and when you get to see an increase of 3%... that's an aberration," King said.

Paying extra

Some users such as Jim Marra, a senior consultant in strategic planning at Brigham and Women's Hospital in Boston, are already seeing that increase.

"We are paying an average of between \$200 to \$300 extra for every new PC we are buying today, compared to what we were paying before" for an average 486-based configuration. That is because new high-end, high-performance Intel Corp. Pentium-based systems with at least 16M bytes of

RAM and a minimum 420M bytes of disk space are being purchased at a very early — and therefore costlier — stage, Marra said.

A relative lull in pricing activity over the last quarter also contributed in a major way to increased ASPs, analysts said.

Users lay hardware groundwork for Windows 95. See page 43

Inching up
Average Selling Prices for PCs rose for the following vendors:

Company	Average Selling Price	
	March	July
Gateway 2000	\$2,543	\$2,568
Dell	\$2,440	\$2,504
Compaq	\$1,811	\$1,830

Source: Montgomery Securities, San Francisco

climbed as much as 3%, despite pricing actions earlier this year.

According to San Francisco-based Montgomery Securities, Average Selling Prices (ASP) went up by about 3% at Dell Computer Corp., 1% at Compaq Computer Corp. and 0.9% at Gateway 2000, Inc.

ASP reflects the average price a PC sold for in the last quarter. At Gateway, for instance, the ASP for PCs in March

News Shorts

Danger: New Microsoft Word virus

A new computer virus that spreads when users exchange **Microsoft Corp.** Microsoft Word documents has been discovered. An infected system may place the virus, called Winword.Concept, in a document that is opened and then saved using the "File/Save As" menu option, said the **National Computer Security Association (NCSA)** in Carlisle, Pa. A PC may become infected if a dirty document is transferred to the machine and opened and Word executes a standard document-resident macro. A free fix is available from Microsoft and NCSA's Anti-Virus Vendor Forum on CompuServe (type "go ncsavirus").

Bad air delays IBM disk array

IBM's storage division suffered a blow last week when it delayed shipments of its Ramac 2 mainframe disk array by two months. The array was slated to ship this week but wound up in a deep freeze until late October. Potential buildup of hydrocarbon contaminants in IBM's 4G-byte disk drives, in part, caused the delay, said James Vander-slice, general manager of the storage unit. Mainframe shops would be especially susceptible to the buildups because of their continual operations, he added.

Cheaper minis from HP

Hewlett-Packard Co. announced a licensing scheme last week for HP 3000

9x9 KS series minicomputers that cuts costs for firms with fewer than 64 users. Starting Sept. 1, licenses will cost \$49,400 for eight users, \$58,000 for 20 users, \$66,700 for 32 users and \$80,400 for 40 users. Previously, the smallest license available from the Palo Alto, Calif., firm was for 64 users, at \$84,450.

Not to be outdone...

IBM cut entry-level prices on its RS/6000 SP parallel processor from \$138,000 to \$90,000 by stripping out the product's communications switch and making it an option. The two-processor model targets application development, and some prospects had complained that the communications switch was an unnecessary expense,

IBM said. Software can also be preloaded for SP customers.

The check is in the E-mail

The **Financial Services Technology Consortium**, a group of 65 banks, technology vendors, academicians and government agencies, last week announced plans to develop an electronic check payment system for the Internet. The system, due to enter pilot testing next year, would let consumers use electronic checkbooks — in the form of PCMCIA cards — to pay bills or buy merchandise from retailers over the Internet.

Netscape extends browsers

Mountain View, Calif.-based **Netscape Communications Corp.** last week announced two extensions to its popular Navigator browser for the World Wide Web. Netscape Chat allows real-time electronic-mail conversation via chat rooms on America Online. SmartMarks is a utility for monitoring and updating users' "bookmarked" favorite sites on the Web. Netscape also promised to ship Navigator Personal Edition for Microsoft's Windows 95 this fall.



Z-mail E-mail package ships

Network Computing Devices, Inc. last week started shipping Z-Mail 4.0 for Windows, an E-mail package for Unix, Windows and Macintosh systems and text-based terminals. The new version supports Microsoft's Messaging Application Programming Interface and comes bundled with a TCP/IP stack. Z-Mail 4.0 is \$165 per user.

MSN inspires antitrust action

As Microsoft basked in the warm afterglow of the launch of Windows 95 and The Microsoft Network (MSN), **America Online, Inc.**'s European partner, **Bertelsmann AG**, last week called for international antitrust action against MSN. But Bertelsmann will not file a complaint with the European Commission. An AOL official confirmed Bertelsmann's statements but had no official comment. "It's an easy story for them to remind people on launch day of this issue," said a Microsoft spokesman, noting the lack of formal complaint.

SHORT TAKES Digital Equipment Corp. will soon ship a version of the **Open Software Foundation's** Distributed Computing Environment (DCE) middleware supporting Microsoft's Windows NT. The DCE for NT products will run on either **Intel Corp.** processors or Digital's Alpha chips.

"Best Features"
"Best Service & Support"
"Best Ease Of Use"
"Best Documentation"
"Best Partner"

— *CIO Magazine Readers' Choice*
*January 1995**

Hmmmmmm.
There Seems To Be A Pattern Here.



IT executives don't always agree on everything. Except, apparently, when it comes to CA-Unicenter®.

Where in a recent survey of *CIO Magazine* readers, they overwhelmingly preferred CA-Unicenter for documentation, features, ease of use, service and support, and as a business partner.

What's more, this is the second year running that



CA-Unicenter has placed first in the *CIO* survey for systems security for UNIX.

**For More Information On CA-Unicenter,
Call 1-800-225-5224, Dept. 10102.**

So if you want the best integrated client/server system management software, choose what IT executives say it is: CA-Unicenter.

COMPUTER ASSOCIATES
Software superior by design.

CA-Unicenter®

UNIX • MVS • Windows NT • Netware • AS/400 • OS/2

© 1994 Computer Associates International, Inc., Ithaca, NY 14850-7000. All other product names referenced herein are trademarks of their respective companies.
**CIO Magazine* 1994 Readers' Choice Awards.

IBM beefs up mainframe for DCE networks

By Craig Stedman
BOSTON

By year's end, IBM will start making the mainframe a more complete participant in client/server networks that use the Open Software Foundation's middle-ware to distribute applications across

multiple systems.

Today, mainframes are limited to being clients in Distributed Computing Environment (DCE) networks, or "cells." But by year's end, IBM will begin beta-testing a second release of its OpenEdition DCE for MVS software that enables System/390s to be DCE security servers.

Based on DCE 1.1 and planned for general shipment next March, the new release will also integrate IBM's mainframe-based Resource Access Control Facility (RACF) security software with DCE's Kerberos security, IBM officials said last week. Users should then be able to log in to a DCE cell that mixes main-

frames and other systems without having to key in multiple identifications.

DCE lets applications run over a combination of systems from PCs to mainframes. The technology is a method of connecting departmental islands, although it has been adopted more slowly than proponents had hoped.



**Keeping client/server
environments in balance
so your applications
don't take a dive.**



Compuware EcoTOOLS maintains that critical balance you need for database, network and operating system elements to get along swimmingly across your client/server environment. In fact, Compuware EcoTOOLS is the *only* fully distributed systems-management solution to focus on the sustained well-being of your applications in UNIX, Sybase or Oracle client/server systems.

For example, you can use EcoTOOLS to scan your enterprise for potential problems and then launch EcoPMON to probe deeper beneath the surface than any other product to find the exact cause. You can even monitor executing SQL statements and track the resources used. Then it's a simple matter for EcoTOOLS' other unique capabilities to set thresholds, sound alarms and make the fix. You can easily automate complex preventative measures to keep your client/server environment in equilibrium. And only EcoTOOLS goes overboard to provide advanced, intelligent monitoring and tuning capabilities for you right out of the box. That's what we call a true "buddy system."

For more information about Compuware EcoTOOLS and how we can help keep your operation afloat, call us at 1-800-368-4ECO.

Nobody knows more about keeping client/server environments from going belly up.

EcoTOOLS®

Compuware and EcoTOOLS are trademarks of Compuware Corporation.
All other company or product names are trademarks of their respective owners.
©1995 Compuware Corporation.

COMPUTERWORLD AUGUST 28, 1995

One by one

IBM will ship DCE 1.1, the latest release of the software, in the following progression:

OPERATING SYSTEM	PRICING DATA
AIX Version 4.1 Shipping in September	DCE client bundled with operating system; servers cost \$1,500 plus \$75 per LAN connection
OS/2 Warp Beta in September	DCE client included in Warp Attach Pack, a \$209 suite with SNA and remote connections
OpenEdition MVS Beta in late 1995	Base DCE services bundled with MVS; DCE security server to be sold as add-on product
OS/400 Version 3 Shipping second or third quarter 1996	DCE services to be sold separately; security and directory server support planned

The upcoming DCE for MVS Version 2 will be introduced in September, but IBM briefed customers on the plans at a DCE developers conference here last week. Also being announced in September is a package that lets mainframes be servers for DCE's Distributed File Service, which would enable users to access mainframe files as if they were stored locally.

Attention grabber

The promised security features drew the most interest from early adopters at the conference. They said automatic mapping of user IDs between RACF and Kerberos is welcome because it will relieve users of the need to build and administer their own mapping tables.

"That would help us out tremendously," said Warren Bernard, chief architect for consumer markets at MCI Telecommunications Corp. in Washington. "We have a huge issue with log-ons, and having a single one would help in our daily operations and in incorporating new users into the network."

MCI's initial forays into DCE, for applications such as transferring phone calls internally and processing credit cards, do not involve the company's mainframes. "But it's not for lack of desire," Bernard said. He added that he hopes to eventually get the mainframe side of MCI into the DCE cell.

Integration of RACF and Kerberos is one of the key steps that mainframe shops interested in DCE have been waiting for from IBM, said Michael Guidry, a technical adviser at Phillips Petroleum Co. in Bartlesville, Okla.



IBM links middleware to legacy computers. See page 69.

BANYAN VINES

You've got PCs in Los Angeles, New York, London, and dozens of other locations around the world. Portable computers running around at all hours. And who knows how many network operating systems out there on your WAN.

If you want to inventory software and hardware, as well as distribute and meter

AppleTalk

PATHWORKS

NetWare

LAN MANAGER

distribution practical. So if you want to distribute 15 copies of Windows 95 or 15,000, go ahead. Thanks to our unique throttling, scheduling, and compression techniques, you can make maximum use of your available bandwidth without choking your network. What's more, with our enhanced application

THERE'S ONLY ONE WAY TO INVENTORY, DISTRIBUTE AND METER ACROSS A WAN WITH ANY OF THESE.

software, you have two alternatives. You can do it manually, machine by machine, site by site. Or you can get your hands on Norton Administrator for Networks 2.0™

NORTON ADMINISTRATOR FOR NETWORKS: THE EASIEST WAY TO MANAGE EVERY DESKTOP ON YOUR WAN.

The new Norton Administrator for Networks 2.0 is the only real-world solution for automating inventory, distribution, and metering across a WAN.

Why? Because Norton Administrator for Networks is the only network-independent solution. And no other solution offers a suite of more highly integrated, feature-rich applications designed for large networks – not even Microsoft's SMS. In fact, Microsoft's SMS doesn't even offer metering. And unlike SMS, with Norton Administrator for Networks, you aren't tied to Windows NT or SQL Server.

With Norton Administrator for Networks, you can track hardware and software inventory around the globe. You can even inventory computers that aren't connected to your network. Even better, you can run the whole thing as a Windows background session, so your users will never feel a thing.

Norton Administrator for Networks also makes large-scale automated software

WINDOWS NT SERVER™

OS/2 LAN Server™

metering, complying with stand-alone and suite licenses is a snap, no matter

how far-flung your organization may be. All of which adds up to a lot of extra cycles for you and your staff.

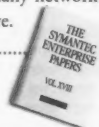
YOU CAN DO EVEN MORE WITH THE NORTON NETWORK SERIES.

Another thing that makes Norton Administrator for Networks so powerful is that it's part of the integrated Norton Network Series. Which means that when you're running Norton Administrator for Networks, you can also run the other best-of-breed Symantec network administration software products.

Products like Norton AntiVirus® NLM, pcANYWHERE™, Norton Enterprise Backup™, Norton Utilities Administrator™, and Norton Disklock Administrator®.

So call us today. We'll show you the easiest way to manage hundreds or even thousands of desktops across your WAN. No matter how many network operating systems you have.

Call us at 1-800-488-9914
ext. 9B59 and ask for our
White Paper "Migrating
to Windows 95: A Phased Approach."



NORTON ADMINISTRATOR FOR NETWORKS 2.0

OPERATING SYSTEM SUPPORT
Supports NetWare, LAN Manager, Windows NT Server, LAN Server, Vines, Pathworks, and AppleTalk and is compatible with HP OpenView for Windows. Also supports Windows 3.1, Windows 95, Windows NT, DOS, OS/2 and MAC OS.

AUTOMATIC ROLL-UP
Automatic roll-up of inventory data, distribution and metering logs across the entire WAN.

REMOTE ACCESS MANAGEMENT
Integration with Norton pcANYWHERE provides instant access to remote workstations from an inventory screen.

METERING
Restrictive or permissive metering of applications and suites.

**DESKTOP AND SERVER
DISTRIBUTION**
Distribution to user groups, workstations, servers, and multiple sites over the WAN.



SYMANTEC.

The following companies are neither associated with nor endorse Symantec or its products: Banyan Systems, Inc., Vines, Apple Computer, Inc., AppleTalk, Digital Equipment Corporation, Pathworks, Novell, Inc., NetWare, Microsoft Corp., LAN Manager and Windows NT Server, IBM, OS/2 LAN Server, Symantec, Norton AntiVirus and Norton Disklock Administrator are registered trademarks and Norton Utilities Administrator, pcANYWHERE and Norton Enterprise Backup are trademarks of Symantec Corp. All other trademarks are the property of their respective holders. Canada: call 1-800-365-8641. Australia: call 2-879-6577. Europe: call 31-71-353111. Visit us on the Internet at <http://www.symantec.com>.



Coast-to-coast reality bytes

From the thrill of people scrambling in the aisles to the agony of empty stores and indifferent customers, Windows 95 entered the real world Thursday.

As users grabbed up the software and other goodies, there would be no more beta users to rely on. Starting at the epicenter of Microsoft Nation, we sampled the grand unveiling at a number of retail outlets across the country.

1. SEATTLE

Searchlights crisscrossed the night sky outside Seattle, guiding "got-to-have-Windows 95" buyers to The Incredible Universe, an electronic superstore here. At 11:04 p.m. — 56 minutes before the software went on sale — the largest contingent of shoppers were from the skateboard set, many of whom had a parent in tow.

Jerry Wilkinson, a parent and family therapist from Kent, Wash., was there with his 17-year-old son, Jared.

Dad hadn't planned on buying a computer operating system in the middle of the night, but then, "I figured we could do something father-and-son-ish, computer-nerdish," Wilkinson explained. At the stroke of midnight, the Wilkinsons were joined at the cash register by Barbara Jackson, a real estate broker.

"To me, it's just a real fun, exciting night. They've made such a big production out of this. It's kind of like when a new car comes out," she said.

Along with her CD-ROM version of Windows 95, Jackson also had stashed in her car a radio-controlled Formula 1 car plastered with Microsoft decals. The toy is regularly priced at \$39.95, but for Win 95 buyers it was thrown in for a mere \$9.95. — *Julia King*

2. SAN BRUNO, CALIF.

The Rolling Stones song "Start Me Up" may be the theme for Microsoft's Win-



dows 95 campaign, but the sound of cash registers ringing up sales into the wee hours of the morning was music to the ears of retailers.

Stocked with more than 6,000 copies of the spanking new 32-bit operating system, some good deals on assorted hardware and about 60 pizzas, the CompUSA store here kept its doors open until 1:35 a.m. Hundreds of late-night customers tapped toes in line for more than an hour to buy Windows 95, the new Microsoft Office and other assorted software and hardware, as well as complete computer systems.

"It's an event, and I just thought it would be kind of fun to come out and buy my copy of Windows 95 tonight," said one San Francisco computer consultant. — *Lisa Picarille*

3. DALLAS

Texans appeared eager for Windows 95 in the Dallas/Fort Worth area, home of computer superstore giants CompUSA, Inc. and Tandy Corp.

Several area stores reported crowds of about 100 on the launch eve, though not all bought Windows 95. A sales representative for one office supply chain

reported much pilfering from advance shipments to area stores. On Thursday, the mayor of Fort Worth launched a program to begin the automatic upgrade of about 400 city computers, with more to follow. — *Patrick Dryden*

4. FRAMINGHAM, MASS.

Computer City — at least the giant outlet here just west of Boston — was better described as ComputerBackwater last Wednesday night. Near-empty aisles at the retailer left more than 25 yellow-shirted salesmen spending a lot of time leaning on software and hardware displays, chins in hand.

A couple and their sleepy 2-year-old daughter walked the aisles and politely listened to three employees run through some Windows 95 highlights. They left without buying anything.

At CompUSA down the street, things were a little livelier, with balloons, non-alcoholic champagne and free copies of *Windows 95 for Dummies* on tap. But not everyone bought. "It's not even real 32-bit. They say it is, but it's really not," complained a teenage computer science major from Boston University. — *Kim S. Nash*

5. PARAMUS, N.J.

It was midnight madness at a yet another CompUSA outlet last Thursday, where more than 500 shoppers jammed the aisles like lemmings to be a part of the historic release of Windows 95. "It was amazing — we didn't anticipate the crowds being as big as they were," said Jeff Hayden, a store manager.

He was in for another surprise. An ordinance prohibits retailers in Paramus from remaining open after midnight — a regulation that various local computer stores were violating. One policeman drove past CompUSA around 1 a.m. and noticed the crowds but didn't bother stopping — until 1:30, when he returned to pick up his own copy of Windows 95. — *Thomas Hoffman*

6. WASHINGTON

Charles Schanker, a 53-year-old lawyer in Arlington, Va., who said he learned to use a computer just 18 months ago, was among the first to buy Windows 95 at a local Staples store. Though looking forward to the Internet access feature for himself, Schanker said he doubted the new operating system would find its way into his law firm any time soon. "We still use DOS," he explained. "Everyone is happy with it."

The manager of one Egghead Software store said it was full of customers when Windows 95 went on sale at midnight. "These were mostly power users, and they were buying armloads of software," he claimed. But at 8 a.m. Thursday, the store was deserted.

A man on the subway on Thursday was wearing a Windows 95 T-shirt and said his company was helping Microsoft with its product rollout at a local hotel. Would the man buy Windows 95 at the show? "No way," he said. "I can't afford the hardware upgrades that I'd need." — *Gary H. Anthes*

Just jokin' around

Humor part of the hoopla — if you can take any more

By Stuart J. Johnston

Although virtually everyone is fed up with the hype and hoopla surrounding the Microsoft Corp. Windows 95 launch, some still have enough wit left for a little humor. A few wags were distributing jokes last week via various electronic-mail systems, including the Internet.

One amusing tidbit had IBM announcing that Rush Limbaugh was now its official spokesman. In exchange for a (rather large) seat on the board, Limbaugh immediately began taunting the "Win-Nazis" and asserting that First Lady Hillary Rodham Clinton was one of the ar-

chitects of Microsoft Exchange.

Limbaugh, the joke concludes, has declared his laptop a Microsoft-free zone and says he will launch a fee-based service in Notes called The Warped Truth.

Then, hot on the heels of Microsoft's reported \$4 million purchase of the commercial rights to the Rolling Stones' hit "Start Me Up" — for use in advertising Windows 95's Start button — comes news of a bidding war for the rights to use another Stones tune.

As the story goes, both Novell, Inc. and IBM are trying to secure the rights to "Sympathy for the Devil." While the target audience is the same, this song would

be used in attack ads aimed at demonizing Microsoft — literally. Other details of those ads campaigns are still sketchy.

But one industry punster, quoting from Bob Dylan's "Like a Rolling Stone," said, "When you ain't got nothing, you've got nothing to lose."

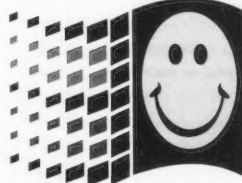
Meanwhile, a parody of another recent Microsoft ad campaign appeared on the Internet. "Where do you want to go today? Never mind where you want to go. We'll tell you where to go."

Not every bit of humor surrounding the launch was fictitious, however.

Although Microsoft has licensed the rights to the entire "Start Me Up" song, it did elect to leave out a few lines. One of

the deleted lines was simply too raw to repeat in polite company. But the other was a line that the company hopes never strikes a chord of recognition with Windows 95 users: "You make a grown man cry. You make a grown man cry."

Speaking of grown men — although this one was laughing — comedian Jay Leno showed up at Microsoft's Seattle campus the day before the launch and took a spin around the company's campus in Chairman Bill Gates' golf cart. Reportedly a gift from Gates' wife, Melinda, the cart looks like a giant Microsoft mouse. Good thing Windows 95 supports the right mouse button, so Leno didn't have to make only left turns.





REMEMBER WHEN YOU WERE GOING TO CHANGE THE WORLD?

LITTLE DID YOU SUSPECT

NETWORK INCOMPATIBILITY WOULD CLOUD YOUR VISION.



Fortunately, there is a way to get all your networks to interoperate as one. It's our new Cisco IOS (Internetwork Operating System™) software.

Cisco IOS™ software is the unifying thread that connects one network to others, so all of your information can flow freely

with optimum performance, at the lowest possible cost. Cisco IOS optimizes WAN performance by increasing your network's throughput. And, Cisco IOS provides you with a scalable, upgrade path to the future.

Available on industry-leading hubs, servers, and wide-area switches, Cisco IOS is

the promise of shared information delivered.

Ready to change the world? Call us at 1-800-859-2726.

We'll help turn your visions of a networked world into reality.





Windows 95 arrives

Apple to Win 95: You look awfully familiar

By Lisa Picarile

If you have managed to escape the massive hype surrounding the launch of Microsoft Corp.'s Windows 95 operating system, you must live under a rock. But if you've missed rival Apple Computer, Inc.'s counterattack, you probably just blinked.

Although Michael Mace, Apple's director of Macintosh platform marketing, said the Cupertino, Calif.-based computer maker has several thrusts under way to promote its Mac OS against Windows 95, its efforts are barely audible compared with Microsoft's mammoth \$200 million media blitz, according to industry watchers.

That could be a problem, despite the fact that according to some observers, Apple is reaping the kind of publicity money can't buy, given the constant comparisons last week between Win-

dows 95 and the Mac OS.

"The impact [of Windows 95] on Apple is potentially very serious," said Chris Le Tocq, president of SoftTracks Software Research, a market research firm in Los Altos, Calif. "Apple should be cranking it up a little more, and they should be doing it now for the high buying season."

Media blitz

At the moment, Apple is countering Windows 95 by barraging the media, industry analysts and the on-line world with daily releases touting the Macintosh's advantages over Windows 95. The theme takes a page out of popular lexicon "been there, done that."

For example, the company sent out T-shirts bearing that slogan. The T-shirt also lists the Macintosh's technological advantages and the year these features were implemented.

While that isn't quite as attention-grabbing as Microsoft's announcement, for which the company spent \$4 million to license the song "Start Me Up" from rock legend the Rolling Stones, "we are reaching a lot of the people that do recommendations," Mace said.

To reach consumers, who are expected to make up the initial wave of Windows 95 buyers, Apple has doubled its advertising budget, according to Mace. One offshoot is the comparative ads that have started to appear in Macin-

tosh and Windows trade publications.

The company also launched a television advertising campaign the day Windows 95 was released. The ads focus less on bashing Microsoft and more on what Macintoshes will do for users.

But some industry watchers said Apple might be better served by waiting a month or so until the Microsoft noise quiets down.

"The Windows 95 introduction will overwhelm Apple," said Jeff Silverstein, editor of the "Software Industry Bulletin" in Stamford, Conn.

"Right now, it's pointless to try and be heard above Microsoft. The basic Mac vs. Windows arguments still haven't changed. It's just that right now, Microsoft is taking up a lot of media shelf space, just like they take up retail shelf space," he said.

But some users said less flash and more substance might be the right answer for Apple.

"I'm not impressed by the Hollywood marketing. I'm impressed when a company does what they said they were going to do. Without that consistency and stability, [you] can't count on them," said Mike Bailey, a systems analyst at Lockheed Martin Missile and Space in Sunnyvale, Calif.

A bevy of new products debuted at the recent Macworld show. See page 49.

What color is your parachute?

Apple has quietly established a plan to protect management if the company has a change in control. Apple, which has denied that it is for sale, in June drew up severance agreements, better known as golden parachutes, for its top executives. The agreements — disclosed in a recent filing with the Securities and Exchange Commission — entitle executives to large payments if they lose their jobs or are demoted following a merger, sale of the company or acquisition of a controlling interest by a new investor.

Apple's counterattack

Apple is combating the Windows 95 hype with the following efforts:

- BLITZING MEDIA AND ON-LINE SERVICES WITH MAC OS VS. WIN 95 COMPARISONS.
- DOUBLING ITS ADVERTISING BUDGET.
- BUYING ADS IN MACINTOSH AND PC TRADE PUBLICATIONS.
- STARTING A NEW TV AD CAMPAIGN.

Microsoft zips lips

CONTINUED FROM COVER 1

managers.

Other locations were more revealing, however. Although CompUSA declined to release early sales figures, company officials did estimate that several hundred copies were sold on average last Thursday at each of its 86 locations. At the Babbages and Software, Etc. chains, spokespeople said sales were 20% to 40% higher than anticipated.

For Seattle-area Keane, Inc. — one of five companies furnishing Windows 95 help desk support — the terms of its contract with Microsoft muzzled the firm from disclosing any information about call volumes or the breakdown of calls from home-based vs. corporate PC users.

Conversations with people who staff Keane's help center were severely restricted last week. One reporter was escorted through the facility by no fewer than three Keane managers and public relations people who monitored all exchanges with personnel.

In disguise

Windows 95 banners and posters were plastered throughout the company, and many of the mostly male, twenty-something staffers were wearing Windows 95 T-shirts.

The Windows 95 users whose calls for help were patched through to any of Keane's 350 staffers were supposed to think they were get-

ting answers directly from Microsoft.

"We want this to feel very much like a single company providing support," explained Deborah Willingham, vice president of Windows 95 support at Microsoft. After being swamped with thousands of calls from users following the release of both Windows 3.0 and 3.1, Microsoft said it now has 1,500 technicians providing telephone support for Windows 95.

Microsoft's heavyweight control tactics also applied to its other launch partners — Unisys Corp., Digital Equipment Corp., Softmart, Inc. and Stream International, Inc. — that were handling overflow support calls.

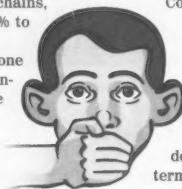
A spokeswoman for Stream International, Inc. (formerly Corporate Software) said she could not disclose information about help desk calls. "Our contract limits us in terms of what we can say [about] the types of calls we receive," she said. "Microsoft is collecting all of that information."

Microsoft executives said they expect a high number of Windows 95 calls because of the number of people who will be installing the new system, not because of software problems.

But Windows 95 support technicians got extensive training anyway. As a result, staffers at Keane's site — which began taking calls from some 400,000 Windows 95 beta users on June 12 — are abundantly knowledgeable about the much-hyped operating system.

Take 23-year-old Linda Hedlund, who last week was answering calls from one of 10 cubicles in the "Romulus" section at Keane.

"I pretty much live, breathe and eat Win 95. A lot of my social life is also around Win 95,"



Linda Hedlund, like other Windows 95 support technicians at Keane, said she lives, breathes and eats Windows 95

Windows 95 buyers get 90 days of free support. After that, users who call Keane will be charged \$30 per call.

said Hedlund, who was to cohost a Saturday night Windows 95 launch party at the home of another Windows 95 technician.

Senior editor Kim S. Nash contributed to this report.

Windows 95 installs easily, our reviewer found. See page 44.

Voice, data share ride on ATM

By Neal Weinberg

MFS Datanet, Inc. is offering users a service that combines data and voice over Asynchronous Transfer Mode (ATM), which is less expensive than ATM for data and separate phone lines for voice.

The San Jose, Calif.-based company is pitching its Wide Area Voice Exchange (WAVE) as a way for high-volume users to merge their voice and data lines into one high-speed network.

Users and analysts say the technology is intriguing, but they have questions about the quality of voice service and pricing.

Catch the WAVE

(Wide Area Voice Exchange)

MFS Datanet's voice, data and video combination

SERVICE: Voice, data and video over variable bit-rate ATM

LOCATIONS: Chicago, Los Angeles, New York, San Francisco and San Jose, Calif.

SWITCH SUPPLIER: Northern Telecom

ATM BACKBONE: 45M bit/sec.

Walter Maio, an analyst at Link Resources, Inc. in New York, said this is the first commercial deployment of voice over a type of ATM called variable bit rate (VBR). He said the advantage is that it dynamically reallocates bandwidth between voice and data.

"VBR is far more efficient than con-

stant bit rate because you only use bandwidth when there's voice to send," Nolle added. With constant bit rate, the customer pays for bandwidth whether it's being used or not.

Jennifer Pigg, an analyst at The Yankee Group in Boston, said there is plenty of user demand for voice over ATM but

not much interest among the major carriers. The carriers view it as cannibalizing their lucrative long-distance voice service.

Pigg said lack of participation by the large carriers has stymied industry group efforts to create voice over VBR standards. But it has also left the door open for smaller companies such as MFS Datanet to jump in and offer the service.

Senior editor Bob Wallace contributed to this report.



BIGGER AND BIGGER VS. BETTER AND BETTER.

MAKE THE BETTER CHOICE — 4TH DIMENSION SOFTWARE

Our competitors are still gobbling up companies—piecing together acquired technology to give a semblance of integration and a hint of interoperability. Meanwhile, we continue to develop and deliver solid solutions for managing enterprise operations automation—while providing the kind of service and support you can rely on.

Based on common methodology, 4th Dimension Software's CONTROL™ line of products provides true integration and interoperability. We supply the most comprehensive solutions for **production control and scheduling, automated systems operations, output management, removable media management and data integrity**—installed at more than 1,400 data centers worldwide.

The choice is yours. Bigger or Better. Make the better choice and call us for more information.

800.347.4694, Ext. 522. or 714.757.4300, Ext. 522.

4th DIMENSION SOFTWARE INC.

Bob Womack, director of computer services at the Boston law firm of Hale & Dorr, uses ATM to send data and has a separate line for voice between the company's offices in Boston and Washington.

"We're paying for a number of bandwidths, with voice and data on separate circuits. It would be great to combine them into a single service," he said.

Womack said he is prepared to "kick the tires in a fairly serious way," but he needs more information from MFS Datanet before he decides. His top concern is voice quality, then price.

Users beware

Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy, cautioned that there are no industry standards for the type of voice service MFS Datanet is offering. "Users need to check with equipment vendors to make sure they use a common voice encoding technology," he said.

MFS Datanet, the operating company of MFS Communications Co. in Omaha, said it will offer two classes of voice service — informational and toll quality, which it described as comparable to a domestic toll call.

The company has launched the service in five U.S. cities and plans a larger roll-out in 1996. MFS Datanet is charging customers an all-inclusive monthly fee that covers equipment, the service and system management.

Prices vary depending on the options a customer chooses. But the firm said a five-node site combining voice and data at T1 speeds would cost roughly \$38,000 per month, compared with \$45,000 per month for separate voice and data.

Scheduling software ignites airline battle

Northwest alleges display bias

By Thomas Hoffman and Mitch Bettis

Northwest Airlines last week called for a government-imposed recall of PC software from American Airlines that biases Sabre Travel Information Network displays so travel agents see American flights "on top" or even exclusively.

The software in question, which has been distributed free to travel agencies, was specifically designed to change the travel agent's displays. The agency's systems administrator loads the software and selects the options such as "AA on top" or "AA only."

A spokesman for the U.S. Department of Transportation said the Northwest complaint is "under review." American Airlines has until Sept. 5 to file an official response. Then the department will determine if the complaint warrants a hearing and further action.

Hazy lines

The complaint, filed with the Transportation Department, charges that American's practice of distributing its Preference MAAnager software free to travel agencies is a pernicious effort to evade the department's regulations against display bias in airline-owned reservation systems.

Federal regulations outlaw such display bias on the grounds that the bias deceives consumers and gives an unfair advantage to the airline that owns the reservation system.

However, travel agencies can legally use third-party software to comply with the carrier preferences of corporate clients who have negotiated volume discounts and want to ensure their employees use those preferred vendors. The American package differs in that it gives preference only to American flights.

Although American's add-on PC software is distrib-

uted by Sabre's sister company, it is unclear whether it is considered part of the Sabre "system" or if it qualifies as a third-party package, experts said.

Northwest argues that American has an unfair advantage with Preference MAAnager because AMR Corp., American's parent company, is the only U.S. airline that has sole ownership of a reservation system.

Sabre commands the lion's share of computer reservation terminals used by travel agents in the U.S. and Canada, with 77,219, or nearly 40%, of all

displays in use, according to a survey this year by *Business Travel News*, a New York-based newspaper.

In contrast, WorldSpan, a reservation system owned by Northwest, Delta Air Lines and Trans World Airlines, runs on 33,000 U.S. and Canadian terminals, giving it less than a 17% market share.

A spokesman for American said the airline was "mystified" by Northwest's complaint. "We feel the type of program we offer in Preference MAAnager is completely legal" under the Transportation Department regulations, which were updated in 1992 to allow travel agencies to buy third-party software that rearranges the system displays to accommodate customer preferences.

Several travel industry consultants said American is exploiting a gray area in the government's regulations because the software is loaded onto travel agency PCs and isn't part of Sabre's mainframe system — where it would definitely be illegal under the regulations.

"It's a pretty sharp marketing ploy," said Robert Langsfeld, a travel management consultant at Langsfeld Fazio & Associates in Incline Village, Nev.

Langsfeld said he doubts American's practice is illegal — although "it certainly pushes the edge" — because travel agencies have the discretion to choose whether or not to use the PC software.

the front of the class."

The products will be rolled out over the next six months, the documents said. The Ethernet Switch Module supports 24 ports, as opposed to six with the older model. The FDDI Switch Module supports two ports as opposed to one.

Cabletron's old Ethernet switching module handles up to 150,000 packets per second, whereas the new module, with its Fast Packet Switch ASIC, can handle up to 750,000 packets per second.

That boosts the aggregate switching performance of the MMAC-Plus by a factor of 10, to 10.5 million packets per second, all without blocking.

Showtime relies on an MMAC-Plus to anchor a video network that editors and producers use to create promotions that run between the cable channel's movies, Pollack said. "With video, we can use all the performance and switched Ethernet ports that they can give us," he said.

Cabletron

CONTINUED FROM COVER 1

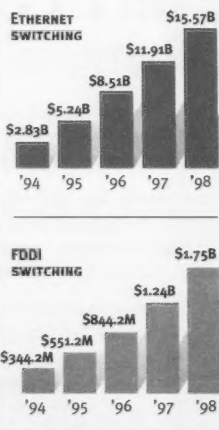
technology in the modules for stand-alone switches: meaning users will not need a full-blown LAN switching system, which could save them thousands of dollars.

With Ethernet switching, network managers can configure each port to deliver a dedicated 10M bit/sec. of bandwidth for a single power user or for a small sub-network of users. Traditional Ethernet, on the other hand, requires many users to share 10M bit/sec. of bandwidth.

Analysts spoke highly of Cabletron's switching modules. "This turns the MMAC-Plus into a very powerful LAN switching backbone network switch at what could be the lowest cost in the industry," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy. "This sends them to

Cabletron looks ahead

Revenue figures and projections in Ethernet and FDDI switching:



Source: Dell'Oro Group, Menlo Park, Calif.

SCO maps out high-end plan

By Steve Moore

SANTA CRUZ, CALIF.

Continuing an aggressive product rollout schedule, Unix-on-the-PC pioneer The Santa Cruz Operation (SCO) last week added management and development tools. And it chiseled out a map that leads its operating system from the 32-bit present to a 64-bit future by 1997.

SCO is bidding to become a bigger player at the high end of the client/server market and a more cooperative citizen in heterogeneous networks. The company unveiled a more powerful version of its OpenServer operating system earlier this year and is rapidly adding features and ancillary products to support mixed Unix and Windows client/server environments.

Santa Cruz on the move

Products highlighted at the SCO Forum conference last week include the following:

SCO's Wintif 95 technology, which lets Unix developers and users achieve the look and feel of the Windows 95 interface without modifying their software.

Software licensed from Go Ahead Software in Seattle that supports alert-based systems monitoring and management for users of the SCO OpenServer operating system.

Back-up technology licensed from Cheyenne Software in Roslyn Heights, N.Y., which allows users to back up Windows PCs and other clients from SCO OpenServer systems.

Mainsoft in Sunnyvale, Calif., will port its suite of 32-bit Windows development tools to SCO OpenServer Release 5.

Providing systems management capabilities is important for SCO because "the smaller business [customers] in their market never used to bother with systems management, but now they want to reduce the load on their administrators when things go wrong," said Angela Hey, an analyst at Input, Inc. in Mountain View, Calif. Also, she added, users want proactive systems management tools that warn of impending problems.

Getting ready

The first products resulting from SCO's new alliances will be available in the first quarter of 1996 (see chart). Until then, users and developers at last week's SCO Forum conference here said they will work toward smooth transitions from earlier operating system versions to OpenServer 5.

"You don't upgrade to OpenServer 5, you migrate to it," said David Gloria, vice president of technical services at Computer Integrators, a software development firm in Richardson, Texas. Careful planning is required to avoid problems during any transition to a new operating system, he added.

Scott McGregor, SCO's senior vice president, outlined the company's Top 4 systems management priorities:

- Managing SCO environments.
- Making SCO systems manageable by others, especially platform vendors such as IBM and Hewlett-Packard Co.
- Managing mixes of SCO and Windows systems.
- Managing other vendors' Unix systems.

While he gave no time frames for achieving these priorities, McGregor added that users can expect SCO to announce a partnership with a major management platform vendor soon.

SCO's plans for a 64-bit operating system — code-named Olympus — are a "competitive necessity if they want to interoperate with real workstations" in high-end client/server environments, Hey said. As more powerful processors and operating systems come to PCs, they will compete with Unix workstations to handle systems management functions.

YOU DON'T BUY A DATA WAREHOUSE. YOU BUILD ONE.

Creating a data warehouse is like building a new home on uncharted territory... you don't know what you're getting into until you start digging the foundation. But you can greatly increase your chances for success by following a few basic rules.

RULE #1: HIRE AN EXPERIENCED ARCHITECT

Data warehousing is simply a new name for accessing, migrating, and staging data for optimum decision support applications... all the things Information Builders has been doing longer and better than any other software/consulting firm in the industry. Our experienced staff of professionals provide complete consulting, planning, implementation and training from more than 35 offices in North America.

RULE #2: LEARN BEFORE YOU DESIGN

Why attempt to restage and restructure data until you learn how it's going to be utilized by end users? Information Builders' EDA/SQL® middleware technology offers your users transparent access to virtually any database on any computer platform. Once they have access to the data, you can analyze how they use it and pinpoint any potential problems. And with our EDA/SQL SmartMode™ system, you can monitor all

database activities so you can develop your most important resources first, design systems that make sense, and enjoy immediate benefits. Best of all, EDA/SQL can extend data access beyond your warehouse database, transforming your entire enterprise into a "Virtual Data Warehouse."

RULE #3: USE THE BEST TOOLS

Thousands of the world's leading corporations use Information Builders' FOCUS 4GL for data migration and staging on more than 35 computer platforms. Our EDA/SQL Copy Manager lets you replicate data from over 60 databases and EDA/SQL Catalog Manager makes managing meta data easier than ever before. Most importantly of all, our FOCUS Reporter for Windows and FOCUS SMP (Symmetric Multi-Processor) provide a level of performance for client/server reporting and decision support simply not available with today's relational tools.

RULE #4: START ASKING QUESTIONS AND YOU'LL START GETTING ANSWERS!

If a data warehouse strategy is in your future, contact your local Information Builders branch office or call us. We'll answer your questions, register you for our FREE Data Warehouse seminar, or set up an appointment for a consultation and evaluation. **1-800-969-INFO.** In Canada call 416-364-2760.



FOCUS and EDA/SQL are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com WWW: <http://www.ibi.com>
All other trademarks are the property of their respective owners.

Information Builders



WHEN WE ADDED A
ONE GIGABYTE HARD DRIVE,
MORE MEMORY AND A
FASTER PENTIUM PROCESSOR TO
OUR INDUSTRY-LEADING DESKTOPS,
SOMETHING HAD TO GIVE.
SO WE LOWERED THE PRICE.

As of August 16, more will definitely be less. Thanks to the introduction of a full range of new Compaq desktops with more horsepower (how about 133 MHz Pentium®) at dramatically lower prices. A feat that could only be topped by (you guessed it) lowering the prices on all of our other desktops by up to 25%. Reliability, manageability and low prices... now, instead of having to choose between performance and value, you can just choose Compaq. **COMPAQ**

As with all Compaq PCs, Deskpro, Deskpro XL and ProLinea are covered by our free 3-year limited warranty. For more information on our full line of desktop PCs, call us at 1-800-345-1318 or reach us on the Web at www.compaq.com. In Canada, we can be reached at 1-800-367-1616. Reseller and retailer prices may vary. ©1995 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. Pentium is a trademark of Intel Corporation.

Cisco unwraps router software features

By Bob Wallace

Cisco Systems, Inc. last week detailed new router software features that will support more secure and less costly LAN internetworks.

The features for Cisco's Internetworking Operating System (IOS) router soft-

ware are called SmartNet and are available as a free upgrade to users who have software maintenance contracts with the company.

SmartNet encompasses three areas: security, policy-based routing and wide-area network optimization.

One new security feature, Message Di-

gest 5 (MD5), is a public domain encryption algorithm that encrypts data sent by routers in an effort to minimize the chances of hackers gaining access to LAN internetworks. The emerging standard for boosting internetwork security is being developed by the Internet Engineering Task Force.

"This is a major capability and a big deal because you don't want people eavesdropping on conversations across your network or injecting anything designed to negatively impact the 'net,'" said David Meyer, a senior network engineer at the University of Oregon in Eugene, a large Cisco shop.

With another new IOS feature, attempts to access a LAN internetwork and the resulting action are logged every five minutes and sent to the console of a network administrator.

"You often don't find out that your network has been violated until it's too late," Meyer said. "With the logging capability, I get the source and destination, the protocol and the port that [hackers] attempted to use."

Be selective

Policy-based routing provides a means for network administrators to specify the type of end users allowed to use various WAN links.

For example, using a simple set of commands, a network administrator could program routers to allow engineers running file transfer protocol to send their often time-sensitive traffic over integrated services Digital Network lines, whereas others could use only lower speed X.25 links.

"With this capability, the network doesn't define corporate policy; policy defines how the network is used," said Kevin Delgadillo, software release product manager for IOS at Cisco. Prior to this capability, there was no means to set any policy, Meyer said.

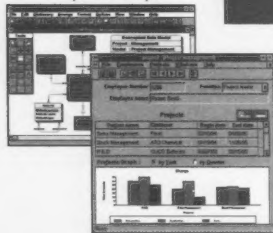
Cisco also announced WAN optimization features designed to minimize use and costs of dial-up links. With the SPX Spoofing feature, keep-alive messages are sent to the local router on Novell, Inc. NetWare LANs. The local router is then fooled into thinking they came from a remote router. As a result, the local router doesn't waste expensive WAN links to send the messages to distant routers.

Another IOS feature, dubbed Floating Static Routes, was designed to improve performance of Apple Computer, Inc.'s AppleTalk or Banyan Systems, Inc.'s Vines LAN internetworks. If a WAN link tied to a specific router goes down, the device can send traffic to an alternate router, which will transmit the data using Floating Static Routes—essentially the routes of last resort—to its destination.

SmartNet features will be incorporated in Release 11.0, which will be available next month.

For fast, productive and fully integrated design and development, Powersoft's PowerBuilder® Enterprise and S-Designer for PowerBuilder are an unbeatable team. PowerBuilder's powerful technology, open architecture and scalable environment have made it the proven choice in application development tools. S-Designer's strength and flexibility have made it the leading database design tool. And now, with S-Designer for PowerBuilder, a version designed specifically for

Fully integrate design and development with the leading tools from Powersoft.



PowerBuilder
and S-Designer.
The *faster*
way to build
better
applications,
the better
way to build
faster
applications.

PowerBuilder, designers and developers have a seamlessly integrated, incredibly robust solution for data modeling and development. For example, you can define extended

attributes in a data model and export it to PowerBuilder for enhanced consistency. Or, from S-Designer, you can generate, in a point and click



fashion, pre-built SQL statements or query objects for PowerBuilder applications, increasing efficiencies in data access. PowerBuilder Enterprise and S-Designer for PowerBuilder. Fast and productive. Tightly integrated. An unbeatable combination. Available together at a reduced price for a limited

time. For more information, or for free technical seminars in your area, please call Powersoft at 1-800-395-3525.

Powersoft
Building on the power of people.

Powersoft Corporation, (508) 287-1500. <http://www.powersoft.com/> Powersoft Europe Ltd., United Kingdom, +44 1494 555555. American Powersoft Corporation Pte Ltd., Singapore, +65 338-0018. All trademarks and registered trademarks are property of their respective owners.

IT'S THE SAME WITH TCP/IP FOR WINDOWS...
WITHOUT GREAT SUPPORT,
YOU'RE NOWHERE.

OnNet™
 for Windows

**NOBODY STANDS BEHIND
 THEIR TCP/IP APPLICATIONS
 BETTER THAN FTP SOFTWARE.**

Face it. Having the latest
 whiz-bang TCP/IP
 applications for Windows
 doesn't mean a thing if



you can't keep them up and
 running. That's why more and
 more companies are installing
 FTP Software's OnNet™, the
 world's most advanced suite
 of TCP/IP applications for
 Windows/DOS. Primarily,
 they're choosing OnNet
 because it *works*. It installs
 quickly and easily, and it's

built like a tank to
 keep on working even
 in the most hostile
 environments. But when
 our customers do need
 help, anywhere in
 the world, we're right
 there with one of the largest,
 most experienced TCP/IP
 development and support
 organizations in the business.
 We also offer introductory and
 advanced training programs,
 and consulting engineering.
 If you're heading into the
 exciting world of global

**GO
 ANY
 WHERE**
 INTERNETWORKING
 SOLUTIONS

internetworking,
 make sure you've
 got the TCP/IP
 company with
 a decade of
 experience behind
 you. Call us for

complete information about our
 growing OnNet product family.
1-800-282-4FTP, ext. 420
e-mail: info@ftp.com
WWW: <http://www.ftp.com>
SUPPORT: 1-800-382-4387
support@ftp.com

ftp Software®
 Opening Windows
 To Productivity.


**Version 2.0
 Available Now!
 Windows 95 Ready.
 Call For Free
 Demo.***

* Qualified U.S.
 Customers Only

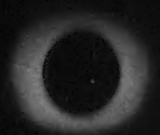
COMPARE	FTP Software PC/TCP® OnNet® 1.2	Novell® LAN Workplace® DOS 4.2	NetManage® Chameleon® 4.5
Architecture (Windows/Dos)	VxD or TSR	TSR	DLL
NFS Client Included	YES (VxD or TSR)	Cost Option	Cost Option
Conventional Memory	3K	42K	6K
File Locking	YES	YES	NO

FTP Software, 100 Brinkstone Square, Andover, MA 01810 (508) 685-3300.

OnNet and the GO ANYWHERE logo are trademarks and PC/TCP is a registered trademark of FTP Software Inc. Other tradenames, trademarks, or registered trademarks are the property of their respective holders.



Great Things Can Happen When



Two Strong Forces Come Together.

Sometimes one plus one really does equal three.

LEGENT

And that's precisely why Legent and CA make such an irresistible combination.

Together, we'll be able to give all of our clients new products and services that would have taken us many years to develop separately. By combining our product lines, we'll offer clients much more comprehensive and effective solutions. With enhanced worldwide ser-

vice and support that no other company can match. In short, it's a win-win-win-win situation. That's what happens when you always put your clients first.

And when two of the world's leading software companies join forces.

For more information, call 1-800-934-4321.
Or visit <http://www.cai.com>.

**COMPUTER
ASSOCIATES**
Software superior by design.

Windows 95 migration poses backup hazards

By Steve Moore

Stand-alone PC users who depend on local tape backup systems risk losing critical data as they move to Microsoft Corp.'s Windows 95.

Backup-related "gotchas" that can destroy data and derail Windows 95 migration

stem from the operating system's use of long file names, its Registry database and potential conflicts between new 32-bit applications and older 16-bit versions.

• Long Windows 95 file names can be truncated and the original file names lost.

• Changes to the Windows 95 Registry database between the time of the last backup and the time of system restoration can be lost.

• Older software running under Windows 95 may not recognize an existing tape drive (device driver).

"We have dealt with all three of those

problems," said Mike Flagg, a systems integrator at Shadow Enterprises in Danbury, Conn., which has been beta-testing Windows 95 for a year and a half. The problems apply only to users who depend on desktop tape backup software and hardware because most users of LAN-attached PCs are protected by server-based backup applications.

Tape backup

Be prepared

Flagg advised PC users to "make sure you have a complete working backup before Windows 95 enters the scene." He noted that while Microsoft provides a long file name backup utility program with Windows 95, "it's a workaround that is very sluggish and not very elegant."

The same description applies to Microsoft's Windows 95 backup applet, which is "very basic, not compatible with other backup applications and supports only a very limited set of tapes," he said.

A Microsoft spokesman confirmed that running older backup applications under Windows 95 can cause problems, particularly with long file names. He added that even though Windows 95 maintains a backup copy of the Registry on each user's hard disk, users should do regular backups to protect against disk failures. Also, he said, Windows 95's backup utilities are provided as a courtesy to users. They aren't intended to compete with more elaborate third-party backup applications.

According to Dataquest, Inc. in San Jose, Calif., only about half of the nationwide installed base of 5 million stand-alone PCs are backed up. Even those users who do have backup software can run into problems with Windows 95. For example, they may be unable to get quick support when a major backup problem occurs because many backup products are sold through OEM channels.

"We have 200,000 registered users [of our backup software], but there are about 2 million people using the product, and sometimes they don't know that we did the software," said Nick Blozan, a product marketing manager at Arcada Software, Inc. in Lake Mary, Fla. The company is mailing Windows 95 upgrade information to its registered users but can't reach OEM users.

Even when older 16-bit applications run trouble-free under Windows 95, "they [have to] run in compatibility mode. So Windows 95 won't be running at top speed because you don't have a 32-bit device driver," Flagg said.

To sidestep problems, analysts said, users should upgrade their applications to 32-bit Windows 95 versions with 32-bit device drivers as quickly as possible.

Process • Manufacturing • Distribution • Maintenance • Financial • Human Resources • Application Development Tool

After all, it takes time to develop superior client/server solutions.

While other companies have rushed headlong to market with bits and pieces of "almost there" technology, Ross has quietly gone about the business of building a superior client/server architecture. And producing a full suite of robust open systems solutions that run on HP, Digital and IBM platforms, using popular databases like Oracle, Sybase, Rdb and Ingres.

IF YOU HAVEN'T HEARD FROM US IN THE LAST FEW MONTHS, YOU SHOULD CONSIDER THAT A VERY GOOD SIGN.

These carefully designed client/server systems offer one critical advantage: They work.

The benefits to you are simple. Implementation time is shorter. People come up to speed faster—with less training. And, since we took the time to find out what business really needs, Ross solutions have the vital functions your company needs to maximize productivity.

If you're a high-growth company, you can appreciate the fact that our solutions are well thought out and ready to start giving your entire organization quick access to information. With no endless implementations. And no delay in ROI.

So find out the difference between software done fast and software done right. Call Ross at 1-404-851-1572, ext. 3400. Then watch your mailbox. We've been too busy to write...but you're going to hear from us now.

ROSS SYSTEMS
WE TAKE THE TIME TO DO IT RIGHT

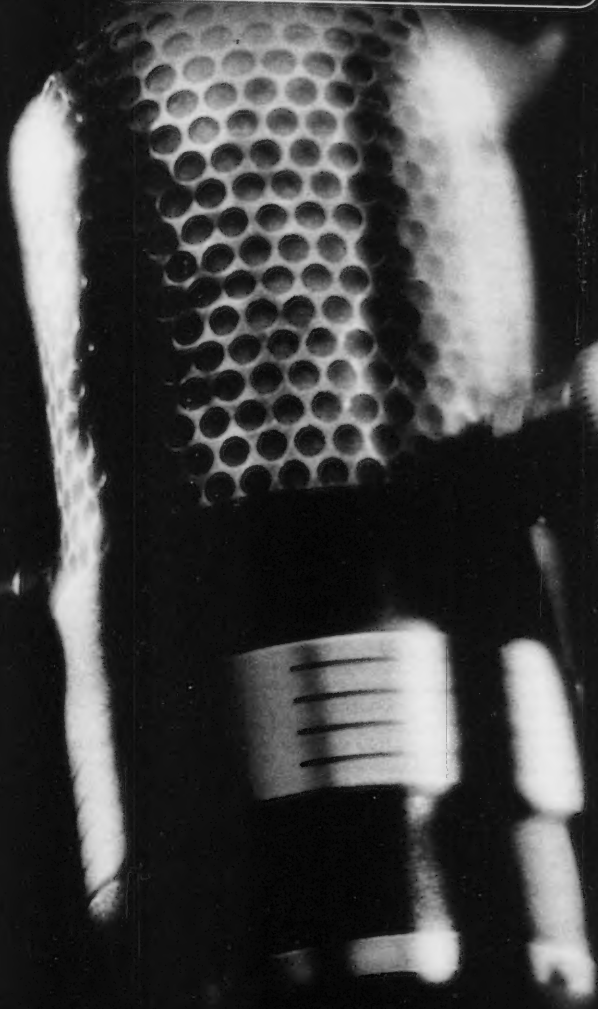
Process • Manufacturing • Distribution • Maintenance • Financial • Human Resources • Application Development Tool

Microsoft's backup utility is "a workaround that is very sluggish and not very elegant."
— Mike Flagg, Shadow Enterprises

Announcing the easy-to-use,
multitasking,
32-bit operating system

everyone

has been waiting for.



Landesgiroklasse Stuttgart • Advanced Software Development Company • Citicorp Diners Club • The Algonquin Forestry Authority • Westfälische Energie Aktiengesellschaft WESAG • Instituto Politecnico Nacional • Nippon Suisan Kaisha, Limited • Berendsen Textil Service • Zhengzhou Crownhand Computer System Engineering Company, Limited • Crédit Lyonnais • Austrian Justice Administration • STD Computer, Incorporated • Zynga Communications Corporation • Cantor Fitzgerald Securities • The Market Has Come to the Beach • KeyCorp • RWE Energie AG • Dash Eng. De. Sistemas, Consultoria E Comércio Ltda. • Nippon Shuppan Hanbai, Incorporated • Bear Creek Corporation • UNICAMP • Bell Sygma, Incorporated • Hawaiian Electric Industries, Incorporated • BlueCross BlueShield of Delaware • The Board of Education for the City of Hamilton • Steuerverwaltung des Kantons Bern • Boem & Parretti S.R.L. • Crédit Mutuel • Malaysian Airline Systems • Shimizu Corporation • Malibu Engineering, Limited • SinoRails Information Technology, Limited • Rechen-Zentrum Trebur • Caixa Catalunya • Hanjin Information Systems & Telecommunication Company, Limited • Vanderbilt University Medical Center • Shanghai Ocean Shipping • Riksforsäkringsverket, RFV • Tren de la Costa S.A. • BANK IN LIECHTENSTEIN AG • Schweizerische Kreditanstalt • Hågaard & Schultz a/s • Swissair Information Systems • Fallon Health Care Systems • Wachovia Corporation • Dogo & Dogo Informática • Österreichisches Statistisches Zentralamt (ÖSTAT) • BANK BUMI DAYA • Washington Mutual Bank • Sun Life Assurance • Omilian Truck Services • Woolworths Plc • RVS Verzekeringen • Carl Karcher Enterprises • RWW Systems, Incorporated • Workshop Distribuidora de Sistemas Ltda. • Sul America Terrestres, Marítimos e Acidentes Cia. Seguros • Xian Crownhand Computer System Engineering Company, Limited • Randco Software Corporation • The Sanwa Bank, Limited • BlueCross BlueShield of Alabama • Kobe Steel Company, Limited • Compensation Rating and Inspection Bureau of RATIO Handel GmbH & Company KG • Vital Forsikring AS • The Nikko Securities Company, Limited • BEWAG • Markeds - og Mediatinstitutt AS • Candle Corporation • Whitewolf Communications • EDC Maglerne • MBS Textbook Exchange, Incorporated • Siam Commercial Bank Public Company Limited • Wintershall AG • Cargill S.A.C.I. Argentina • First Virginia Services, Inc • Laser Mail Services, Incorporated • Topdanmark A/S • American Express Financial Advisors • Sino United Technology, Limited • Cheatenham & Gloucester • R.J. Reynolds Tobacco GmbH • Agence France-Presse (AFP) • SinoChem Electronics Information Technology Company • CJW Associates • Karl Vogt Betonwerk Porta Westfalica GmbH & CompanyKG • Hydra-cylon International, Incorporated • Clarke Reporting Service • Alleanza Assicurazioni • Santa Clarita Health Care Association (SCHCA) • Computers S.A. • KEURO Besitz GmbH & Company EDV Dienstleistungen-KG • MD Foods • Washoe Medical Center • Comune di Verona • Bellaire Group • Union Bank • HaiKou IBC Microelectronics System Company • Banco Bica S.A. • Country Companies Insurance • JIBA International • Union de Prévoyance des Cadres (U.P.C.) • ASC II • Merger International, Incorporated • The Hokkoku Bank, Limited • Metacompagnie • Brabant B.V. • ARAG S.p.A. • Metallgesellschaft AG • ERGIE SA • Finanzinspektionen • Methodist Medical Center • Banco Guipuzcoano • Air Inter • MI TECH Company (Mission Computer) • GROUPE MUTUEL ASSURANCES • Tucson Medical Center • Beijing ComputerLand Company, Limited • Crédit Agricole Val de France • CREDIT FONCIER VAUDOIS • JCB Company, Limited • The Bank of Ryukyus, Limited • Bertel O. Steen AS • Cyranex Corporation • UNIPORT • The Accesses Pvt. Limited • 3D Microcomputers • Hygrade Distribution and Delivery Systems, Incorporated • Dale Management • The Southern California Gas Company • Dalian Crownhand (North China) Company, Limited • Meie Assicurazioni • CPRM - Companhia de Pesquisa de Recursos Minerais • Geological Survey of Brazil • Credencial Argentina S.A. • Beijing Huaneng Systems Control Company, Limited • Danisco • Waseda University • SYSDAT GmbH, Köln • Impuls Küchen • Bank of Hawaii • Indiana Dept. of Transportation • Associated Wholesale Grocers • Colonial Penn Insurance Company • PC Financial Network and Service of the Pershing Division of Donaldson, Lufkin & Jenrette Securities Corporation • Danish Commerce & Company • Realkredit Danmark • The Awa Bank, Limited • Best Line • Simpson Thacher & Bartlett • Delius Klasing Verlag • 17th Judicial Circuit Court • Aarhus Oliefabrik A/S • CPA Sistemas de Informação e Com. Ltda. • ABCO Foods • Direção Processamento de Dados, Limited • CCMX • VEKA, AG • Disability Determination Services of Texas Rehabilitation Commission • The Japan Racing Association • DNHS-WC Data Center • Alliance Insurance Companies • Dobbs International Services • ATCA (Asociación técnica Cajas de Ahorros) • Insurance Services Office, Incorporated • Cable and Wireless, Incorporated • The Royal Hong Kong Jockey Club • VEW Energie Aktiengesellschaft • DOT - Rechenzentrum • SWAG Versicherungen • Raso Enterprises • Dr. David Yamabe P.C. • The Yasuda Fire and Marine Insurance Company, Limited • DST Systems, Incorporated • Athena Design, Incorporated™ • DWAG Deutsche Vermögensberatung Aktiengesellschaft • EA-GENERALI • CAI (Caja de Ahorros de la Inmaculada) • Eicon Technology • Volkswagen Argentina S.A. • Eiker Sparebank • Mercedes-Benz do Brasil S.A. • Assurances Mutuelles de l'Indre (AMI) • Beijing READ TECH & Trade Development, Limited • Realcafe Soluções do Brasil S.A. • BlueCross BlueShield of New Jersey • Enterprise Rent-A-Car • Comunicaciones Empresariales Telemáticas • Beijing Stone Rich Sight Information Tech. Company, Limited • Xin Xing Hi-tech Communication Development Company • Fallon Clinic • Intelligent Environments, Incorporated • DKV Deutsche Krankenversicherung AG • Farmers Group, Incorporated • Centrale de compensation • Amerisure Companies • Hewitt Associates, L.L.C. • Fireman's Fund Insurance Company • Ayuntamiento del Municipio de Puebla • Caja de Ahorro y Seguro S.A. • Schweizerische Mobiliar Versicherungsgesellschaft • Caja Rioja • AMEV • Flagstar Corporation • AFG Industries, Incorporated • BlueCross BlueShield of Florida, Incorporated • Wolfgang DENZEL Kraftfahrzeuge AG • Mercedes-Benz Mexico, S.A. de C.V. • B&B • CSX Transportation, Incorporated • HFC Bank Plc • CPFL - Cia. Paulista de Força e Luz • Frankson Information Management • BlueCross BlueShield of Michigan • Fred Meyer, Incorporated • GAD - RZ der westfälischen Volks- und Raiffeisenbanken • Schweiz Rückversicherungsgesellschaft • Twentieth Century Services • Allianz Life Insurance Company of North America • Galileo International Partnership • Einrichtungshaus Ostermann GmbH • Inter Systems S.A. • Travelers Insurance • Curtidora del Oeste Santafesino S.A.L.C. • General Accident Insurance • ConAgra™ Trading and Processing • Amplifon S.p.A. • GEO do Brasil • Alcabyt • ECI voor boeken en platen b.v. • Toppan Printing Company, Limited • Nishin Steel Company, Limited • NITEK Corporation • Bank of Scotland • CASCO Signal, Limited • Prenatal S.p.A. • Landmark Consulting • Banco Río de la Plata S.A. • Master Trade, Limited • Nordbanken • Nordlandsbanken AS • Bundesländer Versicherung • Erhvervs - og Selskabsstyrelsen • North Pacific Bank, Limited • International Software Development Company • Eric Shoenfeld, M.D. • Molino Hnos. S.A. • Catalina Marketing Corporation • North Carolina Farm Bureau Mutual Insurance Company • Toshiba City Office • Norwest Corporation • NovoPharm Biotech • IKS Informations- und Kommunikationsinstitut der Landeshauptstadt Saarbrücken • NOVUS Services, Incorporated (Discover Card) • ÖSTERREICHISCHE POSTSPARKASSE • CMS Informatique • Nowsec Well Service, Limited • Alfred C. Töpfer International S.A. • NRS Veitch Realty, Limited • Omron Corporation • AKZO Nobel Chemicals S.p.A. • Nationwide Insurance Enterprise • Burlington Northern Railroad • On-line Data • Nolte Küchen GmbH & Company, KG • Onspec Automation Solutions • Banca Agricola Milanese S.p.A. • ÖRAG Rechtsschutz Versicherungs AG • Osaka Gas Information System Research Institute Company, Limited • OSDE Binario • Chevy Chase F.S.B. • A.C. Simmonds & Sons, Limited • Adolf Ahlers AG • Adra Sales, Incorporated • Nissan Norge AS • Maxis • Grupo Financiero Banorte • Padana Assicurazioni S.p.A. • PC Halle S.A. • NMPP • CORCOS Industriale S.p.A. • ARCOR S.A.L.C. • Esso Petroleum Company, Limited • MSR Development Corporation • Paltorn International • Patriot Computer Corporation • BlueCross BlueShield of Western New York, Incorporated • La France Assurances • Mitsubishi Electric Corporation • Argonaut Technologies Limited • Monolog Technologies, Incorporated • Pima County Attorney's Office • Banca Briantea S.p.A. • Pohjola-yhtiöt • Policía Federal Argentina • ARAG Lebensversicherungs-AG • Armed Forces Benefit Association • Banco Shaw/Banco del Sud • Price Waterhouse LLP • Howmedica Incorporated, Division of Pfizer Hospital Products Group • Progressive Insurance Company • Chemnitz Verkehrs-Aktiengesellschaft • Primeware • China National Computer Software & Tech. Service Corporation • Provident Life and Accident Insurance Company • Miles Burke Associates, Incorporated • Proxima Compagnie d'Athens Assurances • Purina Mills, Incorporated • Pontificia Universidade Católica do Rio Grande do Sul • Gjensidige Forsikring • Alm. Brand af 1792 • Caja Sabadell • Grace Italiana S.p.A. • Groupe AXA • Cajun Electric Power Coop, Incorporated • Bofrost Italia S.p.A. • Equitable Life Assurance • FGH Bank N.V. The Realty Bank • Concord System Management Corporation • Grupo Antartica • First Image Management Company • Caisse d'Epargne de Picardie • Westfälische Provinzial Versicherung der Sparkassen • Cera Bank • Grupo Brafo • Mercor Assistance Italia S.p.A. • Shenzhen Aihua - Crownhand System Engineering Company, Limited • SMS • Guangzhou Crownhand (South China) Company, Limited • First National Bank of Maryland • Sintelo Società Industrie Telecomunicazioni • Inter-BBS Asesoría • Fiducia • Crownhand Development Company, Limited • SMABTP • Haggard Clothing Company • BRENNET AG • Consoft International • Health Management Systems, Incorporated • Memorial Hospital of Colorado Springs • GROUPE PUBLICITAS • Kansas Turnpike Authority • Mercantile Stores Company, Incorporated • Hibbert Wholesale (1987) Limited • Grupo Financiero Margen • CSK Corporation • Finnair • Hilgraeve, Incorporated • First Tennessee Bank • Asia Pacific College • Consolidated Communications Incorporated • Assimoco S.p.A. • Hospital Italiano • Huntington National Bank • Central Atlantic Toyota Distributors, Incorporated • ECO S.p.A. • Emphesys Financial Group • ICA Handlarnas AB • Central Health • Eradgas-verkaufs-Gesellschaft GmbH • F4TH - Internacional de Conversões Ltda • Bayerische Raiffeisen - und Volksbanken • Winterthur-Versicherungen • Iceland Frozen Foods • Homag AG • Gobierno de Mendoza-Argentina • First Union Corporation • IMC Proyectos y Consultoría, S.A. de C.V. • Coop Bank • Central DuPage Hospital • IndiCon Software • Dansys Consultants, Incorporated • The Press Association • Columbia House Company • Informatie Beheer Group • Empire BlueCross BlueShield • INGE-COM • Gebr. HAPPICH GmbH • INPE/LIT



OS/2: The proven leader in 32-bit operating systems.

For months now, you've heard a lot of hype about a new 32-bit operating system. We just wanted to remind you that this is nothing new. There's already a proven 32-bit operating system out there. It's called OS/2, and thousands of companies like these—not to mention millions of individuals—have been relying on it for years.

With more than 9 million licenses sold, OS/2 provides a stable 32-bit platform for the constantly changing demands of business computing.

Tivoli tightens TME platform

By Steve Moore

Tivoli Systems Corp. recently introduced an improved version of its systems and applications management platform.

The major enhancement is a new twist on the console feature that includes an automation engine and "rules builder"

Distributed systems management

with which users can implement systems and applications management procedures. Tivoli's platform is called the Tivoli Management Environment (TME); the console piece is called the Tivoli/Enterprise Console (TEC).

Users and analysts said Austin, Texas-based Tivoli has taken a needed step in using automated event correlation to support integrated, enterprise-wide management of computers, applications and network devices.

"Tivoli is really moving along with improvements to TME [and is] able to go beyond simple event messages to automated actions" in response to events, said Paul Mason, research manager of enterprise systems management at International Data Corp. in Framingham, Mass.

Not enough

However, Mason said T/EC 2.5 "can't do some things" that Command Post from Boole & Babbage, Inc. in San Jose, Calif., can, such as manage mainframes and network devices.

One user welcomed increased management integration but was skeptical about its near-term benefits. "Anybody would like to centralize and put all management functions in one product if they can, but then you are likely to run into compatibility issues" when trying to bring in data from

third-party sources, said Patrick Moles, director of networks and operations at Fleet Mortgage Group in Los Angeles.

Moles said Fleet evaluated TME and several other alternatives but is leaning toward the Spectrum management system from Cabletron Systems, Inc. in Rochester, N.H. Cabletron unveiled plans last week to add systems management capabilities to its Spectrum network management platform.

But a Command Post user pointed to the quantifiable benefits of integrating management functions. Command Post's correlation capabilities resulted in 0.2% increased availability of networks and systems for Sprint Corp. in Dallas, said Dave Karthaus, a technical analyst at the telecommunications service provider.

Pieces missing from enterprise technology management

- Correlation of management information across all classes of systems and applications from the desktop to the mainframe, with minimal time spent on defining environment-specific rules.
- Straightforward economical pricing schemes with no hidden or mandatory add-ons.
- Ability to rapidly quantify the budgetary benefits of increased automation.

"That doesn't sound like a lot, but it equates to savings of roughly \$2 million a year" because the software helps spot and react to problems more quickly, he said. Without the correlation capability, several administrators would end up working on the same problem, Karthaus said.

T/EC 2.5 will cost \$65,000, including software for an enterprise server and "a base set of branch [office] servers," a Tivoli spokeswoman said. The total cost depends on how many branch servers are required. Adapter software modules — required to link to customers' databases and management applications with the branch servers — are provided free of charge.

"That \$65,000 is the tip of the iceberg," said Frank Dzubek, president of Communications Network Architects, Inc., a Washington consultancy. The overall cost of the system would be much higher in the large shops for which TME was designed, he added.

Users prep cabling for fast LANs

By Patrick Dryden

Many large organizations are overhauling their network cable infrastructure to support high-speed workgroup applications, according to a recent survey.

Today, use of data-quality Category 5 unshielded twisted-pair (UTP) cable has surpassed phone-quality Category 3 UTP among organizations with more than 1,000 employees, according to Sage Research, Inc. in Natick, Mass. The decision by Ethernet vendors five years ago to support the ubiquitous Category 3 UTP cabling had propelled that 10M bit/sec. network technology to near-universal acceptance. However, users now seek more bandwidth, and many have switched or are switching to Category 5 UTP.

Almost 71% of the survey's 126 respondents have Category 5 UTP installed for LANs. The majority of "fast" Ethernet adapters, concentrators and switches require Category 5 UTP to operate at 100M bit/sec. That grade also supports the UTP versions of Fiber Distributed Data Interface and Asynchronous Transfer Mode transports.

Choosing fiber optics

Anticipating high-speed needs, 43% of those planning to replace or install new network cables within the next four years expect to adopt fiber-optic cable. But Category 5 UTP will maintain its momentum.

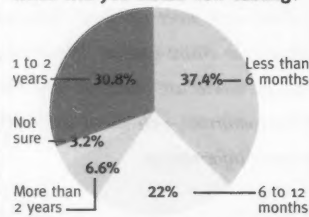
Nearly 60% said they plan to install new network cabling in the next 12 months.

Much cabling currently installed in horizontal wiring systems can't support the performance required by emerging applications, according to Kimberly Steinbruck, who authored the survey.

What is your current horizontal wiring? (Multiple responses allowed)

Unshielded twisted-pair	Category 3	32.8%
	4	12.3%
	5	70.5%
Shielded twisted-pair		36.9%
Thin coaxial		36.9%
Multimode fiber		18.0%
Single-mode fiber		7.4%
Other		2.5%

When will you install new cabling?



Base: 126 organizations with more than 1,000 employees
Source: Sage Research, Inc., Natick, Mass.

Vista cruising

FACTS ABOUT PALINDROME'S VISUAL STORAGE ADMINISTRATOR (VISTA):

Administers multiple Palindrome Backup Director and Storage Manager systems.

Links to network management platforms via the Simple Network Management Protocol.

Vista console software costs \$795; agent software prices range from \$1,495 for a five-user pack to \$79,995 for a 500-user pack.

Palindrome opens up to new Vista

By Steve Moore

Palindrome Corp. last week announced a new centralized storage management application that supports backup, archiving and hierarchical storage management across multiple domains within an enterprise.

The Naperville, Ill., storage provider's Visual Storage Administrator (Vista) console manages only client/server domains in which Palindrome backup software is installed. But the company plans to enable Vista to manage other vendors' departmental backup applications.

"Vista allows me to go to one screen and see the status of backups for our entire company, and I'm looking forward to the day when more applications — like E-mail products — support this kind of centralized management," said Dan Strohl, director of information systems at JSP International in Malvern, Pa. JSP has 10 Novell, Inc. NetWare servers that must be backed up, he said.

Analysts hailed Palindrome's further announcement that it will work to get systems integrators to adopt its products as the basis for client/server storage management outsourcing services.


"Storage management outsourcing has been evident at the minicomputer and mainframe levels for years" and is "a natural" for today's larger client/server environments, said Dan Friedlander, a storage management consultant at Circulus Strategies in Boulder, Colo.

To their liking

Companies with many distributed sites are more likely to outsource storage management functions than those whose operations are concentrated in a single large site, he added.

But some users prefer to handle their own storage management. "It's more economical for me to spend time putting together [storage management capabilities] than to pay someone else to do it," said Michael Atkinson, a systems administrator at Northwestern University in Chicago and a user of Palindrome's backup software.

Vista and other Palindrome storage management products currently run in NetWare environments, but Palindrome plans to port its products to Microsoft Corp.'s Windows NT later this year, with versions for Hewlett-Packard Co. and Sun Microsystems, Inc. Unix variants to follow.



Thanks to Sprint Business,
Rail Europe increased its speed
to 256 kilobits per second.

Real Problem. Rail Europe, the exclusive sales agent for most European railways, needed a way to offer their huge database of schedule and fare information to travel agents all over the world.

Real Solution. Sprint Business put them on track with SprintNet®, the world's largest public data network, with access from 45 countries. What's more, with X.25 packet switching and highly reliable access at up to 256kbps, Rail Europe has quickly become the only stop for thousands of travel agents in the U.S., and as far away as Japan and Australia.

All they need is a PC and the price of a local call to book virtually any train in Europe and the former Soviet Union. 24 hours a day.

Sprint Business technology helped Rail Europe.

Let us help *your* business do *more* business.



Sprint.
Business

1-800-669-4700

©1995 Sprint Communications Company L.P.

*A few unprovoked remarks about UNIFACE application-building
strongware from Reggy "Chainsaw" Morgan, social secretary
of Client/Server Angels International, West Covina Chapter.*



Compuware and UNIFACE are
registered trademarks of Compuware Corporation
© 1995 Compuware Corporation

**Are you getting instant access to the
information you need to make critical
business decisions easily and accurately?**

Introducing Media™: The best Executive Information System and Data Warehousing solution that gives you the ability to visualize, customize, analyze and organize important information, no matter what the source, in exactly the way you want to see it.

Name: _____ Title: _____

Company: _____ Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

I understand the need for speed. Please rush me the:

- ☐ demo diskette ☐ send me information
☐ have some one call me immediately

SPEEDWARE

1 • 800 • 276 • 9950

BECAUSE SLOW IS DEAD

SPEEDWARE



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 452 SAN RAMON, CA

POSTAGE WILL BE PAID BY ADDRESSEE

SPEEDWARE USA, INC.
MARKETING DEPARTMENT
3000 EXECUTIVE PARKWAY - SUITE 111
SAN RAMON, CA 94583-9667





COMPUWARE®
Uncomplicating Your Life

"Anybody who don't know
that **UNIFACE** strongware is the real stuff
for real systems don't know diddled
if you get my drift. It kicks butt outta
all that wimpy stuff you read about
and it's built for the long haul. Let
me put it another way. If any of
you heavy breathers haven't gotten the
word about **UNIFACE** yet, let me urge
you to call 800 365-3608 or I might
have to introduce you to my
big brother Waldo.
He's a real salesman,
that guy."

UNIFACE



WHAT THE BIG GUYS USE

Computer Industry

Digital seeks PC crown

Despite setbacks, firm plans new models, distribution

By Michael Goldberg and Neal Weinberg

Digital Equipment Corp. set a goal in 1994 to become a Top 5 PC vendor by the end of 1995. But more than halfway through the year, the company hasn't even cracked the Top 10.

Three weeks ago, the company reported that PC revenue rose only 20% in the latest quarter after a streak of 100% increases. Within 48 hours of that announcement, PC business unit head Bernhard Auer was ousted.

Enrico Pesatori, vice president and general manager of Digital's computer systems division, is temporarily leading the company's PC business unit. He said he plans to name a replacement in a few months.

Pesatori, who joined Digital in early 1993 to head up its PC group, said in an interview last week that the Maynard, Mass.-based company will continue to



Digital VP Enrico Pesatori says the company will continue to seek top-tier PC status

seek first-tier PC status by increasing its presence in retail stores and introducing desktop, laptop and PC server models.

Pesatori said the PC business unit's goal is to increase revenue by at least 40% between now and next June.

He said he will add more retailers to his PC distribution list over the next few weeks. But he acknowledged that Digital is not quite ready—from infrastructure and product standpoints—to ramp up to the consumer market penetration enjoyed by PC leaders such as Compaq Computer Corp.

"The retail channel is on the borderline of the market, and the Digital brand name does not stand exactly as a consumer brand name. There is a lot of brand awareness to be built," Pesatori said.

Meanwhile, he said he would ensure Digital coordinates its PC sales efforts

with marketing programs for other systems such as the AlphaServer family. He said he will make certain Digital leverages its service organization—which has a staff of 800 trained to support Microsoft Corp.'s Windows 95 and Windows NT operating systems—in order to harvest sales throughout the enterprise.

Digital needs its PC business to grow to pollinate sales of its servers and other products and services, he said.

Without rising PC sales, "you cannot afford to have the economies of scale to defend the different market segments where you play. ... To compete with Compaq and Hewlett-Packard and IBM in those fields, you need the volumes" from the corporate and consumer sides, Pesatori said.

Analysts said Digital is following the right course by seeking more consumer PC outlets and offering new products, such as it did last week with the Starion series for home users and the Celebris for business desktops. Analysts said the company is doing reasonably well considering its late entry into the field and that it may be unrealistic to expect a continued speedy climb in the PC market standings.

Consent decree with Microsoft finally approved

Questions linger about NT

By Mitch Bettis
WASHINGTON

"This hearing will be short and sweet."

That is how U.S. District Court Judge Thomas Penfield Jackson opened last week's status meeting on the government's 1994 antitrust settlement with Microsoft Corp. And true to his word, it was.

Within 20 minutes, as required by a previous court ruling on the matter, he brusquely signed the long-delayed consent decree.

Still hot

The Department of Justice reiterated several times last week that it is continuing to investigate Microsoft to see if there have been violations of antitrust laws or the consent decree. One probe involves industry complaints about the bundling of Microsoft's on-line service with Windows 95.

The accord, which settles charges that Microsoft stifled competition in the PC operating system market, will govern Windows licensing practices for the next 6½ years. Among other things, it prohibits charging a per-processor license fee even if the Microsoft operating system is not installed, a practice that has discouraged PC makers from

loading non-Microsoft operating systems.

A remaining question is whether the decree will cover Microsoft's Windows NT. The accord explicitly states that it covers Windows 3.1 and its successors (such as Windows 95), but not Windows NT. However, the U.S. Court of Appeals in Washington said it is logical to assume that if Windows NT does become a successor to Windows 3.1, it will be covered.

The Washington-based Computer & Communications Industry Association (CCIA) argued that Windows NT is already viewed as a successor in the corporate market, but Jackson dismissed the trade group from the case and didn't rule on its motion to add NT to the decree.

Microsoft spokesman Greg Shaw in Redmond, Wash., said, "NT is not being marketed as a successor, so it's clearly not a covered product under the consent decree." Yet Microsoft has said Windows 95 is a short-term product that will eventually give way to Windows NT.

Jackson's signature ended an antitrust battle that was anything but short and sweet. After four years of investigations, the Department of Justice and Microsoft reached a settlement last July, but it was rejected by federal Judge Stanley Sporkin as "too little, too late."

An appeals court booted Sporkin from the case for apparent bias and sent the decree back to the district court to be signed. Jackson, who was selected by random drawing, had no choice but to approve the deal.

Government funds 21 research projects

By Gary H. Anthes
WASHINGTON

■ **Magnetic tape moving at a mile per minute, the Library of Congress on a desktop and 17-byte optical discs are among the goals of six research projects funded recently by the U.S. Department of Commerce.**

The awards were made to high-risk ventures as part of the government's controversial Advanced Technology Program (ATP), which Republicans in Congress have pledged to scuttle [CW, Aug. 7]. The Commerce Department announced 21 new ATP projects, six of them dealing with data storage technologies. The projects are funded by \$71 million in federal grants and \$67 million in matching corporate dollars.

The projects are geared toward developing technologies able to record data up to a thousand times faster and at a lower cost than is now possible. The research is driven by the emergence of data-hungry applications such as video-on-demand and networked medical systems, a grant recipient said.

"This is interesting stuff, and stuff that needs to be done in order to move forward from a technological stand-

point," said Michael Sutton, president of Washington Systems Consulting, Inc. in Gaithersburg, Md.

However, Sutton joined Republicans in questioning the government's role in fostering end-use technology. "It is interesting to us that the government would single out some of these companies to give them fairly serious money when there are other companies that have pioneered these efforts," he said.

Super storage

In one of the projects, a group of companies led by Terabank Systems, Inc. in Campbell, Calif., will match \$11.5 million in federal funds over five years to build a prototype 20T-byte desktop storage device, initially for NASA. NASA would use the units as compact, low-cost devices to store huge amounts of data from space probes, said Don Dempsey, president of Terabank.

The units are expected to cost less than \$100,000. They would use erasable optical tape, which is a very high-speed tape transport system, and laser arrays able to access data at 100M bit/sec.

Joseph King, head of the National Space Science Data Center at NASA

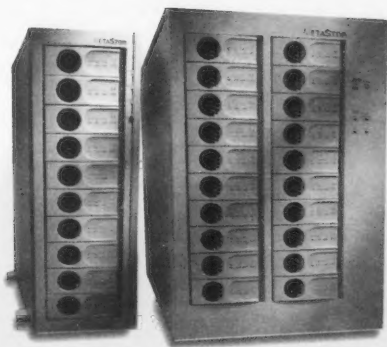
Goddard Space Flight Center in Greenbelt, Md., said the devices would give space scientists quick access to terabytes of desktop data. Currently, those scientists must get data via wide-area networks from huge jukebox systems at a few central data repositories, a process that is slower and more costly, King said.

Observers agreed that the projects are risky. "Some of this stuff is pie-in-the-sky. A lot of it will never happen," said Jim Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif.

Porter said some of the hoped-for advances in data storage technology may be rendered unimportant by advances in conventional magnetic disk recording technology. Recording densities are increasing at 60% a year and seem likely to continue at that rate for five to 10 years, he noted.

A spokesman at the Commerce Department said first-year funding for the ATP projects is assured, but their fate in subsequent years depends on congressional action this fall. Recently, the House of Representatives eliminated all fiscal year 1996 funding for the \$341 million ATP, but the Senate has yet to take action on it.





METASTOR™ GIVES YOU SUPERIOR RAID PERFORMANCE AT A LOW PRICE.

For years, Symbios Logic has built a reputation among OEMs as an excellent RAID supplier. Now we're offering our products directly to you as MetaStor. With MetaStor, you'll find qualities like:

- ◆ Leading edge RAID performance with the MetaStor DS-10 at a price unmatched in its category. The DS-10 also includes an optional tape backup.
- ◆ The best performance available—the MetaStor DS-20 is capable of 4,400

I/Os per second—at the lowest price per MB in the mid-range class.

- ◆ A flexible configuration, offering multiple concurrent RAID levels 0, 1, 3, 5, and the option of having 10 or 20 drive maximum configurations.
- ◆ Ability to upgrade easily, since future migration paths are built in.

To find out more about MetaStor, call 1-800-86-ARRAY or return this card today.

METASTOR™



YES, I'M INTERESTED IN A GOOD VALUE.

Please send me more information on the high-performing MetaStor Family.

NAME:

TITLE:

ORGANIZATION:

ADDRESS:

CITY/STATE/ZIP:

TELEPHONE:

FAX NUMBER:

E-MAIL ADDRESS:

I AM: AN END USER

A RESELLER

A SYSTEM INTEGRATOR

A DISTRIBUTOR

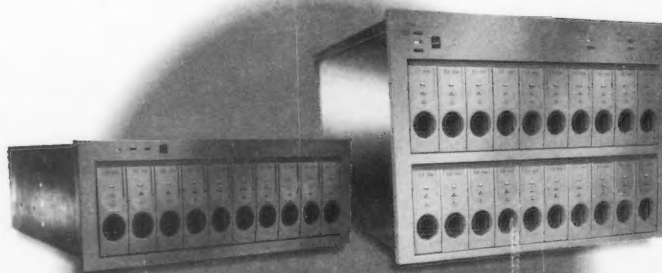
MY CURRENT OPERATING ENVIRONMENTS ARE:

NETWARE

NT

UNIX

OTHER:



**METASTOR GIVES YOU THE
FLEXIBILITY TO CHOOSE BETWEEN
A DESK-SIDE OR AN OPTIONAL
RACK-MOUNT CONFIGURATION.**

*Like the desk-side units, the rack-mount subsystems are
available in either 10 or 20 drive maximum configurations.
Both are designed to fit into industry standard rack cabinetry.
And of course, they deliver the same MetaStor high
performance at a competitive price.*

METASTOR 
SYMBIOS
LOGIC



NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

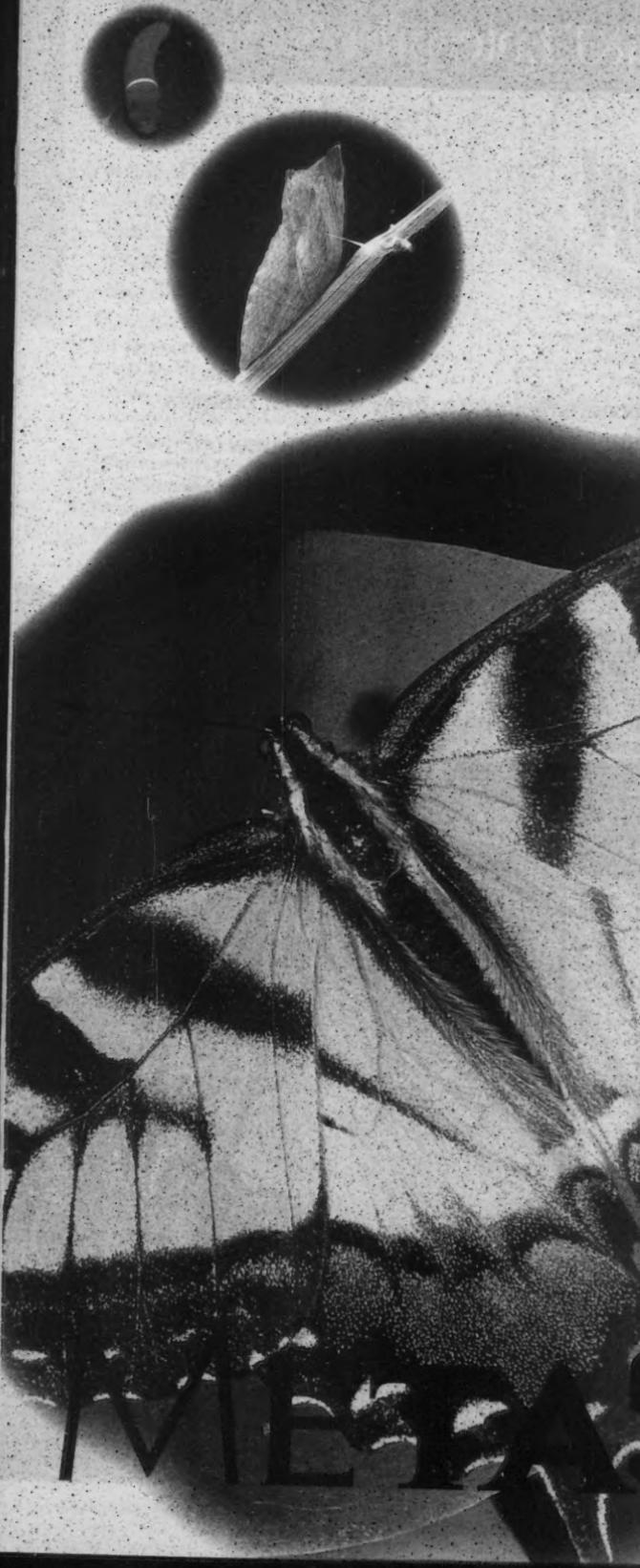
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 5916 WICHITA, KANSAS

POSTAGE WILL BE PAID BY ADDRESSEE

SYMBIOS LOGIC
PO BOX 782380
WICHITA KANSAS 67278-9823





**BRAND NEW
AND ALREADY A THIRD
DEVELOPMENTAL STAGE.**

It sounds like a contradiction — something both new and already developed through three stages. But just as a new butterfly emerges from the chrysalis after life as a caterpillar, the MetaStor Series 3 RAID Subsystem Family from Symbios Logic comes complete with a proven lineage.

Our company has been at the forefront of RAID technology since disk arrays were in their infancy. As divisions of NCR and AT&T Global Information Solutions, we pioneered RAID storage technology and developed it through three generations. But the systems were built only for OEMs. Now, as Symbios Logic, we're offering our third generation RAID subsystems directly to you.

The MetaStor Family is designed to be a complete network storage solution, fulfilling a range of data storage needs from single processors to large networks. Our years of experience working with OEMs has culminated in making the MetaStor family the highest performing RAID subsystems available, at a low price.

And now its high performance and features can belong to you. To find out how

MetaStor can make your performance soar, call 1-800-86-ARRAY.



METASTOR™

Informix's Phil White on AT&T Enterprise Servers.

Our database is designed to grow with your business.
AT&T Servers are the perfect engine for it to grow on."

Phil White, CEO, Informix Software



Informix and Dynamic Scalable Architecture are a registered trademark and trademark, respectively, of Informix Software, Inc. AT&T 3050 shown features Intel processors. The Intel Inside Logo is a registered trademark of Intel Corp.



At AT&T, we're committed to making sure all the applications you need are optimized for our servers. That's why we've developed an alliance with a leading database provider like Informix.*

Whether you're just starting to test an application out on a uni-processor or running it on an SMP

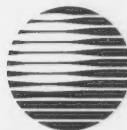
cluster, the one thing you can't afford is a database that can't grow with your business. Informix's Dynamic Scalable Architecture™ gives you the ability to start out all your enterprise apps at one level and then scale them up rapidly on as many processors as you need. And the platform that has the scalability and flexibility to enable you to use Informix's scalable capabilities to the max? The Enterprise Servers from AT&T. The scalable database platform.

To get more info about AT&T Servers, call 1 800 447-1124, ext. 1130.

 **INFORMIX®**

**GET
move
USE IT**

*Bringing computing and communications
together to help you get, move and
use information.*



AT&T
Global Information
Solutions

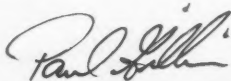
Editorial

Win 95 explained

Now that you've got your shrink-wrapped copy of Windows 95, you should become familiar with the new terms you'll encounter as you enter the PC's next generation.

Here's a selected glossary:

- **Windows 95** — The culmination of an 11-year effort by the PC industry to clone the Macintosh.
- **32-bit** — The approximate amount of space remaining on a 100M-byte hard disk after Windows 95 is installed.
- **Eight.three** — File-naming convention on MS-DOS, replaced by Windows 95 feature that allows files to have easy-to-remember names like Letter_to_mom_about_why_I_cannot_come_over_Sunday_for_dinner.
- **Multitasking** — The ability to run multiple programs at once, making it much easier to pinpoint which one just crashed your system.
- **Start button** — The Windows 95 version of C:\>.
- **Network Neighborhood** — Windows 95's term for the collection of computers in your office that can now more easily create and exchange multiple, differing versions of the same data.
- **"My computer"** — What your PC was before you connected it to the Network Neighborhood.
- **Upgrade** — Software industry term for the process of selling a user the same word processor for the fifth time.
- **Windows NT** — Microsoft code name for Windows 98.
- **Maintenance release** — Computer industry term for software released about six months after shipment of the original product that does what the original product was supposed to do.
- **Single Inline Memory Module (SIMM)** — Spider-like computer chip used to add RAM to a computer. Become familiar with SIMMs. You will buy them by the bucket.
- **The Microsoft Network (MSN)** — On-line service owned by Windows 95's developer and offered automatically to every Windows 95 user and which is in no way monopolistic or has any unfair advantage over any other on-line service by virtue of being right on your screen all the time. Honest.



Paul Gillin, Editor
Internet: paul_gilltn@cw.com

Viewpoint



Letters to the editor

Software piracy: Cheers, jeers and tales from the front

You express shock at the brazenness of the illegal resellers and the volume of the piracy business [CW, July 24]. I am astonished at your astonishment. Where have you been for the past 15 years?

Bill Laberis' editorial laments, "this amusing tale... would be just that—a nice yarn—if it didn't cost the companies that wrote the software... billions of dollars per year." I find this sentiment genuinely laughable, considering that on page 32 of the same issue, you report record quarterly gains for the computer industry. Software companies are *not* being hurt by piracy. Is anyone bothered that Microsoft isn't making quite as much money as it might were piracy miraculously curtailed?

Piracy exists because legitimate licenses are expensive—beyond the means of most people overseas and beyond the means of many people here in the U.S. That's why piracy also flourishes here at home. Domestic piracy can't be controlled, so what makes anyone believe that the slightest dent can be made in the practice overseas?

By the way, would Windows be where it is today if it wasn't copied freely, like its predecessor, DOS?

Mike Batchelor
Arnold, Md.
<http://www.clark.net/pub/mikebat/mikebat@clark.net>

The software copyright situation ironically continues a historical trend: A century ago, the U.S. was one of the worst thieves of intellectual property. Developing countries tend to misappropriate the technology of more advanced na-

tions as part of their economic development. The solution, as you described, involves government-to-government negotiations because private enforcement is often impractical or impossible.

A licensing system would be more effective. Payment could be made on a government-to-government basis. Upon [sale of the licensed copies], the proceeds, less actual expenses, would be repaid to the vendor-victims.

U.S. copyright owners cringe at the thought of compulsory licensing, which undercuts ownership and control provisions of national and international copyright law. But at some point, realities of the international marketplace must intrude. Laws can protect "value" but not abstract morality.

Robert W. Dibert
Floyds Knobs, Ind.
RDibertN@counsel.com

No real loss

The SPA and *Computerworld* should stop crying about software piracy in Russia. If the average Russian makes \$160 a month, how can anyone claim to have lost money if he buys a couple of bootleg programs? What money was lost? There is zero chance that the Russian would have bought the software through legitimate channels, because he doesn't have the money.

Bill Guenther
Shepherdsville, Ky.
BGuen@aol.com

On the front page of your July 31 issue you included a pull quote from your Novell story that states, "Some ingenious users have managed to inveigle 'bootlegged' copies" of the NetWare requester ["Novell on target to ship Win 95 requester"]. But you have a separate article on the same page regarding rampant software piracy.

Are we saying it's "ingenious" to "bootleg" prerelease copies of software but illegal to do so with released software? It's probably the same people doing both.

Mark A. Nadig
Fort Collins, Colo.
74250.1500@compuserve.com

Software piracy should be a major concern for all of us in the legitimate information systems field. Our IS departments support and enable our companies as they compete with others around the globe. Some competitors reduce their costs relative to ours by using pirated software. They implement systems we can't implement because we can't fit them in the budget. It isn't just software vendors that are the victims of piracy.

David M. Weaver
MicroGenics
Concord, Calif.
dmweaver@mercury.sfsu.edu
More letters, page 40

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

COMPUTERWORLD

Professional Courtesy Voucher

☐ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.
For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price

~~\$48.00~~

Your Special Rate

\$39.95

Your Savings

\$8.05

E4H5-2

COMPUTERWORLD

Professional Courtesy Voucher

☐ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.
For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price

~~\$48.00~~

Your Special Rate

\$39.95

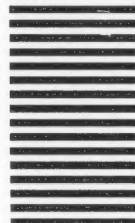
Your Savings

\$8.05

E4H5-2



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1131 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPT
375 COCHITUATE ROAD
FRAMINGHAM MA 01701-9494



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



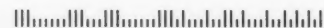
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1131 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPT
375 COCHITUATE ROAD
FRAMINGHAM MA 01701-9494



Editor in Chief
Bill Laberts
Editor
Paul Gilin

News Editor
Maryann Johnson
Technology Evaluations Editor
James Connolly
Sections Editor
Johanna Ambrosio
Assistant News Editor
Patricia Keefe
Assistant Sections Editor
Michael Fitzgerald
Technical Editor
Charles Babcock
Senior Editors
Craig Steinhilber, Large Systems
Rosemary Callas
Client/Server Software
Laura DiDio, Networking
Elizabeth Heichler
Application Development
Bob Wallace
Internetworking
Mid-Atlantic Bureau
Thomas Hoffman, User Strategies
Julia King, Client/Server Software
Cheryl Gerber, PC Software
Washington, D.C., Bureau
Mitch Betts, Social & Legal Issues
Gary H. Arnes, Government & Security

West Coast Bureau
Jean S. Bozman, Open Systems
Kim S. Nash, Internet
Steve Moore, Storage Management
Lisa Picarelle, PC Software
Pacific Northwest Bureau
Stuart J. Johnson, PC Operating Systems
Southwest Bureau
Patrick Dryden, Network Management

Senior Writers
Jalilman Viljanen, Neal Weinberg,
Mindy Blodgett, Michael Goldberg
West Coast Bureau
Sunuchi Mohan
Staff Writer
Tim Ouellette

New Products Writer
Stewart Deck
Graphics Coordinator
Stefanie McCann

Features Department
Senior Editors
Joseph Maglitta, Corporate Strategies
Lory Zottola Dila, In Depth
Allan E. Alter, Management
Kathleen Gow, In Depth

Associate Editors
Jodie Naze, Careers and Marketplace
David B. Weldon, Management
Cathleen Sagne, CW Guide

Senior Researcher
Kevin Burden, Firing Line/Scorecard

Special Projects Editor
Bruce Rayner
Managing Editor, Special Projects
Joyce Chutchan-Ferranti

Senior Research Manager
Bob Fink
Research Analyst
Laura Hunt
Fluegelman Intern
Amy Malloy

Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Alcardi Maguire

Senior Copy Editors
Kimberlee A. Smith, Ellen Fanning
Michelle J. Key

Copy Editors
Kimberly Gilliland, Ray J. Izoff
Michelle Grabon, Roberto A. Fusaro

Design Director
Tom Monahan
Senior Graphic Designers
Nancy Kowal, Mitchell J. Hayes
Janell Genovesi

Graphic Designers
Mary Beth Welch, David Waugh
Cartoonist
Rich Tennant

Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell, Connie Brown
Alexandra Skulte

West Coast Bureau: Chris Flanagan
Computerworld Client/Server Journal
Alan Alper, Editor
Catherine McCrory, Managing Editor
Mary Brandel, Senior Editor
Stephanie Faucher, Graphic Designer

Electronic Marketplace Liaison
Lisa Davidson
Rights and Permissions Manager
Sharon Bryant

Main Editorial Office
Box 9175, 500 Old Connecticut Path
Framingham, Mass. 01701-9175
(508) 879-0700; TDD: (800) 428-6244
MCJ Mail: 279-6273
CompuServe: 76537.2413
Subscriptions: (800) 669-1002

For more information on how to
contact Computerworld editors,
see page 124.

CD-ROMs: Glitzy and wrong

David Michael Bernard



Those technosleek
CD-ROMs aren't as
accurate, speedy or
durable as end users may
expect.

A CD-ROM telephone directory is a great idea, right? You can look up all your old college buddies and far-flung relatives. You go out, buy it, bring it home, tear open the container and load it.

Then you do the first thing that comes to your normally self-centered mind — look for your own name.

Bummer.

At this point, many people are shocked to discover that they do not exist or still live with their parents or that there is some other error in their listing.

Here is an example of state-of-the-art technology that bombed out. Many people are so misled by the technosleek image of CD-ROMs that they figure the information on that gleaming disc is as good or better than in the book. The fact is, it's as good or worse.

A major reason for the inaccurate and incomplete data is that the original source of the information — the local telephone companies that rule the world of telephone numbers — is not involved in the CD-ROM directories.

Not that the CD-ROM makers don't try hard — they do. One gets data-entry clerks in China to input the data from telephone books and

uses multiple accuracy controls. But the telephone book is outdated by the time it is published.

Correctness also depends on the method and timeliness of distribution. At best, the CD-ROM is as accurate as the phone book, which is just a snapshot of data that changes daily. At worst, the CD-ROM version may be a year behind the phone book.

The same criticism applies to CD-ROMs that dispense legal or medical advice; they are not necessarily any more complete or accurate than the latest book on the subject.

For data that is constantly changing (such as telephone directory data), *on-line access* to a database (What a concept!) is the only means of distribution that maintains its integrity.

CD-ROMs are all the rage now. You can find them anywhere, from Barnes and Noble to your

local video store. They have a high-tech image that sells, but they are still a static medium that is only as good as those who put it together.

Then there is the speed issue. Take this test: With a PC and CD-ROM on your left and a phone book on your right, see which one allows you to find an entry faster. I'm fast with the CD-ROM software, but I'm even faster with the book.

Besides, you can't put a hot cup of coffee down on a CD-ROM like you can on an old-fashioned phone book.

There is a misconception that CD-ROMs last longer and are more durable than other media. While that's a valid assumption when comparing audio CDs with vinyl records, it doesn't hold true for heavily used CD-ROMs. CD-ROMs are consumable; I have witnessed the demise of several over a short period of time.

So remember that CD-ROMs are great for static reference works, but they have their limitations. They don't last forever, and they don't necessarily have the best information. If you need medical advice, call your doctor. Don't call CompUSA.

Bernard is a corporate IS director, entrepreneur and consultant in New York. His Internet address is davidbernard@attmail.com.

Marketing triumph, technical yawn

Max D. Hopper



The hype is great, but
historians won't be
putting Windows 95 in
the technology hall of
fame.

The release of Microsoft's Windows 95 is a product launch of epic proportions: "Years in the making... a cast of thousands." Every number associated with this software's development, testing, marketing and distribution has a vapor trail of zeros. No information systems

product has ever had the potential to affect so many users. And no software release has ever aroused so much competitive opposition nor been so beleaguered by bureaucratic intervention.

One question worth pondering is how Windows 95 will weigh in as an IS milestone in the annals of computerdom a decade or two hence. In an industry as young as ours, it may be naive to speculate on historical significance and even riskier to attempt a future perspective. Still, it's interesting to reflect on the probable role of Windows 95 in any IS hall of fame.

In the category for genuine breakthroughs in technology, I don't think Windows 95 is a serious contender for top honors. I would award that position to IBM's System 360, which was introduced in 1964. For its time, I believe, this mainframe system represented a revolutionary departure from the past. In terms of its radically new emitter-coupled logic circuitry, its operating system and its integrated approach

to a complete family of large and small computers, it presented unprecedented new capabilities that changed the course of computing. The 360 series was a triumph of technology.

Nor could Windows 95 be described as a breakthrough product in terms of usability. It builds on the previous version of Windows, which in many respects was a somewhat flawed version of the graphical user interface popularized by the Macintosh in 1984. In that sense, the ease-of-use honors would have to go to Apple with an acknowledgement to the pioneering Xerox Star GUI, which inspired both the Macintosh and Next Computer systems. These products, whatever their market success, were triumphs of user friendliness that paved the way for broad consumer acceptance of the PC. In fact, if any of these companies had marketed their operating systems independent of the boxes they came in, they may have

preempted Microsoft's success.

If Windows 95 is accorded a place in the IS pantheon, I believe it will be as a marketing triumph. Marketing has long been Bill Gates's genius and is fundamental to his company's phenomenal success. Surely this new operating system will provide extended capabilities to current Windows users and perhaps surpass the edge that Macintosh and OS/2 users have enjoyed. Whether it will help Microsoft extend its present market share remains to be seen, but the inertia of a massive installed base is on its side.

Let's give Microsoft credit, though, for having generated that inertia on its own corporate steam. No company has been better at driving IS products into the marketplace and achieving acceptance by tens of millions. No company in our industry is more skilled in managing the marketing and distribution issues of doing business on this unprecedented scale.

Will it fulfill the considerable expectations it has generated? Only time will tell. Will Windows 95 be surpassed by even more capable products? Of course it will. The question is, who will build them? Perhaps Netscape?

Hopper, former chairman of AMR Corp.'s The Sabre Group, is principal of The Max D. Hopper Associates consultancy in Dallas.

This yard with **no fences**
brought to you by new Microsoft Office



© 1999 Microsoft Corporation. All rights reserved. Microsoft, the Microsoft Office logo, and the Start button are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™



Announcing new Microsoft® Office for Windows® 95.
Software that doesn't hold you back. Software that presents fewer obstacles.
Five integrated applications, one entirely new approach to the way they work.
It's not merely an "upgrade." It's not just about new features and new buttons.
It's about easier, more intuitive access to capabilities old and new.
Software that speaks your language, that answers your questions.

Now you have a suite of productivity programs designed to take advantage of Windows 95.
Programs that let you focus on your work, not on your software.



Viewpoint

Letters to the Editor

Americans themselves fuel the pirate trade

I am a veteran of the U.S. Air Force and spent one tour in South Korea in 1990. In the shopping areas around most U.S. bases, you could find stores that sold pirated software [In Depth, CW, July 24].

Most of it was sold to these stores by American service personnel.

These stores stay in business because of Americans out to make a quick buck by selling software stolen or copied from base agencies, homes or friends. The prices were relatively low, and if you needed a manual, no problem; they had copies of them, too.

Software piracy will be hard to stop. As long as there are greedy people out to

make an extra buck selling pirated software, there will be people to buy it.

D.S. Weir
PC analyst
Chicago

74750.201@compuserve.com

What an efficient marketing strategy. Instead of paying to distribute free software to gain market share like America Online does, software makers have someone doing it for free. Pirated soft-

ware is bought mostly by students, startups or private users, and mainly for evaluation or learning. Customers in Eastern Europe are very brand-sensitive — when they get resources to buy the legitimate copy, they do. The legitimate copy is then proudly displayed to send a message to the customer: "Look, we are a stable, profitable company."

If I am competing with Microsoft and my software is not being pirated in China, my investors should start to worry.

Vendors compromise by attaching enough negative stigma about stolen intellectual property so that only the economically desperate will use the stolen goods. But at the same time, they don't stop this free technique to gain market share through the use of effective copy protection or encryption.

Jiri Janecek
Snohomish, Wash.
janecek@halcyon.com

The articles on pirated software were most interesting. I especially liked the comment about unreconstructed Bolsheviks loving Microsoft Word 6.0. Word 6.0's performance reminds me of a Soviet ministry cranking up to meet a five-year goal.

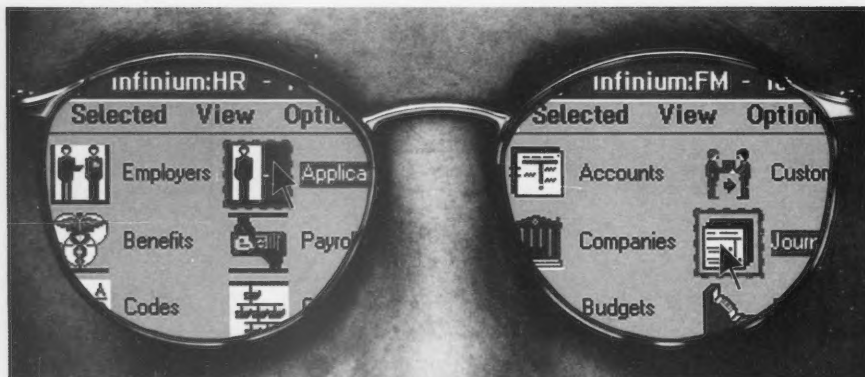
However, I take exception to your editorial statement that "[Clinton] and his minions at the Commerce and State Departments sit idle while the Chinese, who have a \$15 billion trade surplus with the U.S., allow software piracy to go on unchecked."

First of all, President Bush also was "idle" while the Chinese ran tanks over protesters, produced goods in prisons, pirated software and ran up a big surplus. Second, Clinton hasn't been "idle" at all. Don't you recall State Secretary Warren Christopher's trip to Beijing and the deliberate insult by their government?

But finally, the truth is business wants Clinton to do exactly what he is doing. Other industries that want to sell in China are very nervous about anything that ripples the trade waters. Clinton is an easy target, but put the bulk of the blame where it belongs: in corporate America.

Jim Mork
Minneapolis
72120.370@compuserve.com>

Software that gets to the point. And clicks.



Infinium: Human Resources and Infinium: Financial Management eliminate the cumbersome steps required in traditional business applications.

Users can quickly identify, access and analyze specific information using simple point-and-click, drag-and-drop PC techniques.

And *Infinium's* intuitive customization capabilities, combined with the strength of the AS/400™ Advanced Server, dramatically reduce the complexity of implementation.

Together, they provide the best return on your client/server investment.

All pointing to software that clicks. For everyone concerned.

Find out more. Call 800 725 7668.

Software 2000

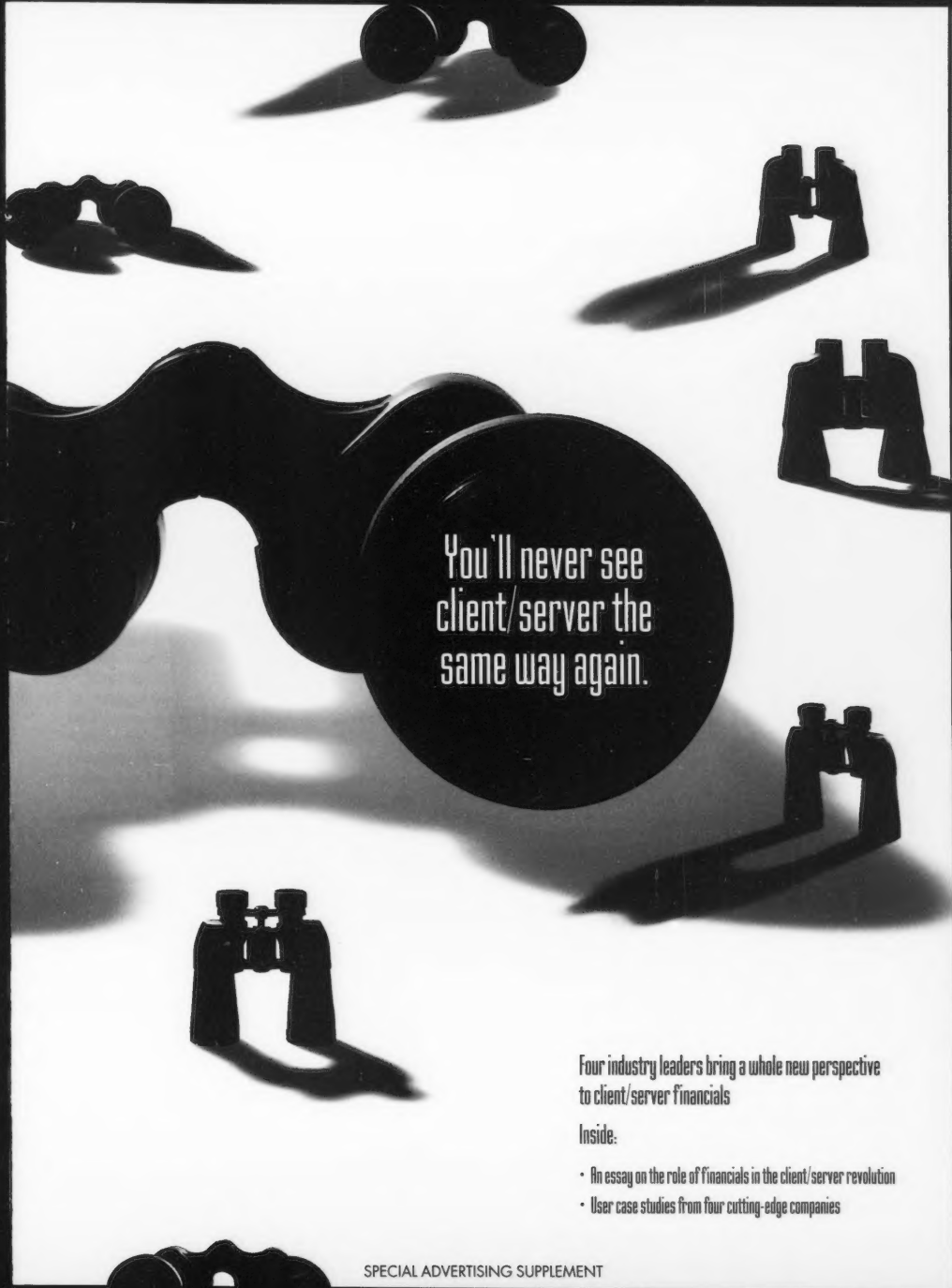
Advanced, manageable client/server applications. Not just another pretty GUI.



An investment in prevention

I know how software companies could reduce piracy in developing companies: Open up shop in the countries that are pirating software, hire local programmers to port the software to local languages, provide the same level of support as they do in the U.S. and Europe, invest in the local economies and make it possible for people to afford the software they can't afford now.

James Lewis Moss
Columbia, S.C.
moss@cs.sc.edu



You'll never see
client/server the
same way again.

Four industry leaders bring a whole new perspective
to client/server financials

Inside:

- An essay on the role of financials in the client/server revolution
- User case studies from four cutting-edge companies

SPECIAL ADVERTISING SUPPLEMENT

Setting new sights on client/server financials.

It's a story heard in corporate boardrooms around the world:

Move to a new information distribution system, or move out

Microsoft of business. For some time, the answer has been to move off the mainframe and on

to client/server solutions. But for all client/server's promises of a new computing paradigm, it seemed that only the top tier of companies with the clout to drive development and the capital to invest could afford the shift.

All that is changing. In this special supple-

ment, you'll read about how client/server has come down to earth in the form of affordable, accessible solutions from Microsoft, **COMPAQ** Platinum Software, Compaq and Intel.

Starting with the essay on client/server's cutting-edge technology, you'll see how client/server solutions are becoming more accessi-

intel. ble for more businesses. And in four case studies, you'll see how companies like yours are using these

solutions to affect deep and lasting change in their financial systems, and across their businesses. Whether you plan to migrate now or in the future, their stories will change the way you see client/server.



Client/Server Visions and Realities

by Cheryl Currid

Is client/server computing ready to take over the world of financial applications? After years of debate and false starts, there are clear trends in both technology and market acceptance that make the transformation to client/server inevitable. For mid-to-large sized organizations, the choice isn't whether to move to client/server, but when—before or after your competitor.

Industry analysts and researchers show surprising uniformity in their judgment of client/server acceptance. Analysts from Forrester Research claim that about 65 percent of Fortune 1000 companies are implementing some form of client/server application today, up from 30 percent in 1990.

Results from researchers conducting International Data Corp.'s (IDC's) 1995 Global IT Survey concur. Over 60 percent of the respondents said they have, or were planning to move to, client/server solutions.

And, researchers at Dataquest, Inc., expect the client/server market to rise at twice the rate of the overall computer systems market during the next four years. Dataquest predicts sales of servers will double in the next three years to reach an annual rate of over 315,000 units worldwide.

What's fueling the move to client/server computing? According to Currid & Company analysis, client/server platforms make sense in a business world where people need flexible access to information. The old method of providing pre-formatted batch reporting doesn't satisfy the needs of increasingly sophisticated users or competitive industries. It doesn't put decision-making information into the hands of the right people.

Further, the re-engineering rage of the past few years also caused business managers to question every practice, from the methods used to answer accounting questions to how the phone is answered. If a computer system can't provide answers to new management questions, it moves to the top of the replacement list.

Surveys of IS professionals show that accounting applications are the first choice for initial client/server implementation. Forrester interviews with senior IS managers revealed that 84 percent expect to implement client/server applications in the financial and manufacturing area within three years. Of those moving to client/server, 43 percent will purchase application packages rather than build their own. IDC's analysis agrees. It names accounting as the leading segment among enterprise applications for client/server deployment.

Why? Accounting and financial applications truly span enterprise information needs and provide critical information to executives. In fact, as much as 85 percent of information analyzed by executives is financial.

Further, senior finance professionals are keen to share financial data among executives in an effort to guide overall business strategy. A recent IDC survey showed that the top three responsibilities for financial professionals were to improve:

- Timing and availability of financial information
- Integration of financial and non-financial data
- Financial services to operations managers

Clearly, it is easy to demonstrate the need and desire to move accounting and financial applications to a flexible computing platform. Client/server architecture fills the bill with built-in capabilities that allow it to work with a variety of data analysis tools.

Build versus buy

Custom-developed computing applications are giving way to purchased packaged software. According to IDC, sales of packaged client/server applications are soaring as customers move toward plug-in solutions. IDC expects packaged client/server applications to continue as the industry's largest and fastest growing segment, with a predicted 30 percent compounded annual growth rate through 1999.

The decision to buy rather than build client/server accounting applications is easy to make. Financial and IS managers cite four primary reasons:

- In-house capabilities
- The need for quick deployment
- The use of standard approaches
- Overall cost of ownership issues

Many organizations lack the in-house knowledge of client/server tools necessary to embark on extensive custom development. While client/server technology has become more sophisticated and easier to learn, in-house programmers must scale a significant learning curve. It takes a good programmer six months to a year to fully analyze data and application requirements and then learn all the nuances of a full fledged application development tool.

“Clearly, it is easy to demonstrate the need and desire to move accounting and financial applications to a flexible computing platform. Client/server architecture fills the bill with built-in capabilities that allow it to work with a variety of data analysis tools.”

These steps are unnecessary when packages that provide highly customized features are available.

Further, since pressing business needs require quick action, there's no time to custom-craft accounting applications. Packaged software can be implemented within a window of two to six months.

Conversely, custom-created software generally takes a great deal of time to create, test, debug and implement.

Finally, most organizations are pleased to learn the extent to which packaged solutions can be customized. Using technology tools such as Microsoft Excel and Access, companies can tailor a good fit between their business practices and packaged software. Moreover, by leveraging advanced reporting capabilities and common desktop productivity tools, they can easily respond to changing business needs.

“The changing mix of computing hardware, robust operating systems and packaged software has made the move to client/server an attractive option. Rather than trying to retool existing legacy systems, business-minded managers find it easier to buy low-cost—but advanced—hardware.”

Technology gains

The changing mix of computing hardware, robust operating systems and packaged software has made the move to client/server an attractive option. Rather than trying to retool existing legacy systems, business-minded managers find it easier to buy low-cost—but advanced—hardware.

Today's solutions, based on mass-marketed hardware such as Intel microprocessor-based servers—and robust operating systems, such as Microsoft's Windows NT—create options that were neither available nor economically viable three years ago.

Sophisticated operating environments have created a simplified approach for computing. For example, Microsoft BackOffice for Windows NT seamlessly links Windows-based desktops to corporate information, regardless of location or original format. Clearly, powerful tools that manage the desktop-to-server environment are available.

Changes in a company's options for client/server technology center around advances in both technology and user acceptance. Tumbling technology

prices provide yet another strong incentive for making a move. For example, since 1991 the costs associated with processing, storing and sharing data have plummeted.

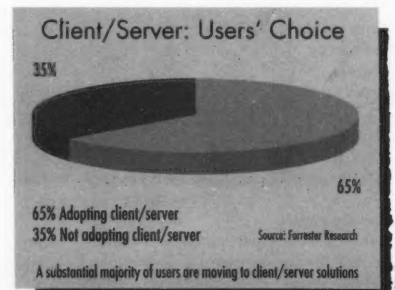
The cost to perform one million instructions per second (MIPS) has decreased from \$93 in 1991 to \$20 in 1995. Similarly, the cost to store a megabyte of data has plunged from \$7.28 in 1991 to less than 34 cents today, according to Dataquest. Sharing or distributing data via a modem also has dropped exponentially, from \$1 per megabyte in 1991 to about 18 cents in 1995.

Although the declining cost of raw computing power is always welcomed, two other factors have emerged to make microprocessor-based technology attractive for mission-critical computing applications. These are manageability and scalability.

Today, hardware makers are using sophisticated techniques to make low-cost servers more manageable. Rather than simply turning a PC on its side and calling it a server, some manufacturers are building in advanced fault management capabilities. These include monitoring and reporting features, redundant servers, backup servers and fault-tolerant drive arrays.

Compaq* for example, pioneered technology that watches over key server components and alerts a system operator if an unusual condition exists. These servers can actually report on problems before the problem even interrupts service to users. Such features are new to the microprocessor-based server world and were unavailable to all but expensive minicomputers 10 years ago.

Another attractive feature of new-generation servers is pre-configuration. Some servers come with easy-to-use utilities that both load and optimize operating systems and databases. These options allay concerns about buying new technology because they lead to plug-and-play solutions.



Scalability is another important factor in the server equation. Scalability ensures that technology solutions won't run out of gas if something changes. Today's servers and operating systems, such as Compaq ProLiant™ and Microsoft Windows NT, offer the ability to grow with the needs of a business. They can support multiple processors, large amounts of disk storage and large numbers of users without changing the overall infrastructure. With this kind of scalability, if a company's needs change radically, the company doesn't have to obsolete or change its core technology platform.



Developing trends

There's no doubt that the combined forces of business pressures and available technology make a compelling case for client/server solutions. Few organizations can tolerate systems that don't do the job or provide effective management information.

Today's options, including ready-to-use software, plug-and-play hardware and robust and bulletproof operating systems, can ease the adoption hurdles. These options allow organizations to move quickly toward the resolution of nagging issues caused by legacy systems.

Currid & Company expects that the market for application servers will accelerate throughout the balance of the decade. Although they currently constitute an estimated 20 percent of server sales, we project that application servers will account for 50 percent over the next three to five years.

Packaged software will also continue to emerge as the preferred method for companies deploying core business applications, such as accounting and manufacturing. Companies will gain competitive advantages by strategically using the information from these systems—not by creating custom data processing applications.

VARs (value added resellers) will play a key role in the transformation to client/server solutions. According to a recently published Gallup poll, 26.8 percent of companies surveyed already use the services of VARs for help with client/server applications. Currid & Company believes that percentage could rise to about 40 percent or more as VARs add value with specific expertise in technology integration plus techniques for setting up software to best support the business.

The dramatic price/performance capabilities of technology, coupled with features that make servers nearly self-managing, will continue to produce convincing reasons for firms to retire old legacy systems. Mid-sized organizations could be the quickest to accept new technology. These organizations generally have fewer intertwined legacy systems and can make technology investment decisions faster.

Is client/server computing ready to take over the world of financial applications? For progressive organizations, the options available today create excellent opportunities for implementing more responsive business systems. The technology is ready. Business managers must now ask themselves: Are we?

About Cheryl Currid

Cheryl Currid is president of Currid & Company, a Houston-based technology analysis and advisory firm. Ms. Currid lectures internationally about how to reap the rewards from technology in business, professional and personal pursuits. Her opinions on computer industry trends are frequently quoted by leading business publications and other media, such as *The Wall Street Journal*, *The New York Times*, Reuters, Associated Press, *Investors Business Daily*, *Forbes*, *Fortune*, PBS, ABC News and CNBC.

When it comes to financial software that
not many other companies

runs on Windows NT and SQL Server,
can say this. In fact, none.



That's right. More than a hundred major companies have already selected our new client/server financial software—which makes it the number one choice on Microsoft® Windows NT™ and SQL Server™.

And for good reason. Our Platinum® SQL NT gives you incredible price/performance. The flexibility you need for your business. Plus innovative, easy-to-use features like Financial Alerts. All optimized for Windows NT and SQL Server and tightly integrated with Microsoft Office and OLE 2.0.

And it's all from Platinum, the financial software company that's been the leader in technology for more than 10 years. And the only one with Windows NT and SQL Server financials. To get your financials on Platinum SQL NT, just call us at 1-800-215-5550.



PLATINUM®
The Financial Software Company™

Century 21 Real Estate Corporation: A remodeling job

Scribble your request on a piece of paper, tie it to a rock and throw it over the wall. That's how Lisa Kingston describes most relationships between IS departments and their companies. At some point in the future, the answer comes back over the wall. "Maybe it's right, maybe it's not, but that's what you get," she says.

Kingston should know. As director of financial information systems for Century 21 Real Estate Corporation, she used to spend a lot of time behind the wall, trying to get answers out to the financial team. "We've broken down those barriers now," she says. "There's much more sharing of information."

One of the barriers was a 15-year-old, character-based minicomputer system with dumb terminals and custom-written software. For managers at the world headquarters in Irvine, Calif., and at the seven subsidiaries around the country, volumes of financial data were virtually inaccessible. This was a significant problem for CENTURY 21® and the CENTURY 21 system, comprising one of the world's largest real estate sales organizations, with more than 6,000

independently owned and operated offices around the globe.

Organization-wide change

In 1988, management began evaluating how the financial information system could be improved. Everyone soon realized that change was needed on an enterprise-wide basis, and managers began talking client/server.

"We investigated solutions and Microsoft was one of the leaders in client/server technology. We began a relationship with them, using the full suite of Microsoft products," says Kingston. Microsoft SQL Server was proposed as the relational database management system, ensuring compatibility with the existing applications.

CENTURY 21 also chose Platinum SQL Enterprise from Platinum Software Corporation because it met two critical criteria: it was the only complete, fully integrated financial product with a client/server architecture, and it offered Microsoft compatibility.

By 1992, Platinum SQL Enterprise was up and running at the international headquarters in Irvine. The production server, a Compaq ProLiant with two Pentium® processors, 64 MB of RAM, and 6 GB disk space, is currently in operation. Two servers are planned for each divisional office, and Kingston repeats that the hardware systems have been very reliable.

In addition, Compaq Insight Manager™ has proved helpful as a proactive server management system, predicting faults and monitoring performance to prevent downtime.

Now she says, manual entry time has been dramatically reduced, and financial managers are re-engineering basic codes and procedures. They're also performing analysis on a variety of financial indicators.

The client/server system has extended information beyond the financial department walls and in to other areas of the company. "The accounting staff can look at financial information and everything else it touches," Kingston says. "They don't have to log into six different systems. From their perspective, they can see much more of the world and how it affects their business needs."

Because financial managers are performing more analysis, they're also planning better strategies. "If a particular product line isn't performing to plan, we know about it sooner and we can act quickly and cut our losses, rather than taking years to make a decision," notes Kingston.



Lisa Kingston—Century 21 Real Estate Corporation

VITAL STATISTICS Century 21 Real Estate Corporation

Irvine, CA

MISSION

Continue outpacing global competition, which requires CENTURY 21 to distribute financial data to every level of the CENTURY 21 organization, from corporate and divisional headquarters to 6,000 independently owned and operated broker offices throughout the world.

CLIENT/SERVER PROFILE

Platinum SQL Enterprise General Ledger, Accounts Payable, Accounts Receivable, Cash Management, Inventory and Order Entry

SERVERS

Compaq ProLiant with dual Pentium processors running Microsoft SQL Server and Microsoft Windows NT Server

CLIENTS

A variety of Compaq desktops with Intel 60 MHz and 90 MHz Intel Pentium processors

Cutting closing time in half

In addition to trimming general ledger transaction time by 30 percent, Kingston reports that closing time has been cut in half, from eight to four days. "We can also create recurring and automatic transactions so that on a monthly basis they generate themselves, instead of someone having to re-enter the same thing over and over."

Re-engineering is more than a trendy buzzword at CENTURY 21 as it moves toward a truly enterprise-wide system. "When it all fits together," Kingston says, "it's very elegant in a true sense of the word."

Ceridian Corporation: No shortage of information

When you provide information services to the world, you'd better have a great plan for getting information to your own management. At Ceridian Corporation, a defense electronics and information services company, financial data used to take a slow course from the company's headquarters to the cost center managers scattered throughout the company's three business units.

The problem was the company's Cleveland-based mainframe. The McCormack & Dodge system running on the mainframe demanded some serious attention and couldn't keep pace with the company's changing requirements.

"We had to take hard-copy reports, copy them and mail them out," says Jim Furgason, corporate controller. "Managers often waited until the middle of the month before they saw reports of what happened the previous month. And it was difficult to tell what was in those numbers."

Furgason and his team provide accounting for Ceridian's corporate center and benefits accounting for three autonomous operating units: Employer Services, Arbitron and Computing Devices International. Each of the business units takes independent systems directions.

Getting it done

In 1993, the nearly \$1 billion company pushed the envelope on information access when top management announced plans to sell off the Cleveland data processing center. Suddenly, Furgason had 18 months to select, implement and train users on a new financial management system.

Furgason, along with John Leuthard, manager of external reporting and systems, opted for a move to client/server. The team standardized on Microsoft SQL Server for NT and then purchased Platinum SQL NT client/server financial applications from Platinum Software Corporation. Ceridian's corporate office went live on general ledger last January. Accounts payable followed closely behind on March 1.

The team made its deadline, but more important, Furgason reports that managers can now access financial information directly from their PCs: "With SQL NT, we can put files on the network and allow the cost center managers to drill down to the level of detail they need. They've become more active participants in managing their numbers."

Fast information access

Instead of waiting until the middle of the month, managers now access month-end reports in just two days. Leuthard says the information also is more definitive. "Before, it was difficult to tell what was in the numbers," he explains. "Now they can look in the database and get information on, for example, which bills were paid and when. So they can make better, more informed decisions."

Ceridian's corporate center has taken an integrated approach to hardware and software, with Compaq ProLiant servers based

VITAL STATISTICS
Ceridian Corporation
Minneapolis, MN

MISSION
Move toward open systems after selling off data processing unit and mainframe computer. Accounting and finance operations develops a new information system within 18 months.

CLIENT/SERVER PROFILE
Platinum SQL NT General Ledger and Accounts Payable

SERVERS
Compaq ProLiant servers with dual 90 MHz Intel Pentium processors running Microsoft SQL Server and Microsoft Windows NT Server

CLIENTS
90 MHz to 120 MHz Intel Pentium processor-based desktops running Microsoft Windows for Workgroups

1994 REVENUE
\$916 million

1994 IS BUDGET
Unavailable

on Intel Pentium processors. "Intel processors are as important in the clients as they are in the server," Leuthard says. "We need a lot of horsepower on the desktops, so we're running all Intel processors at our corporate center and most of the business units. In fact, everything we're buying right now is Pentium. The Compaq servers have been very reliable for us."

In addition, the system is handling heavy volumes of roughly 6,500 to 7,000 transactions per month, and up to 600 invoices in accounts payable.

To keep tabs on the servers, Ceridian uses Compaq Insight Manager on all servers, and Furgason reports that managers have been very satisfied with its monitoring capabilities.

At first, Furgason was concerned about the complex maintenance associated with the client/server environment. Now, he says the client/server financial system provides a new flexibility for Ceridian's corporate center. According to him, "We control our schedules now, and we're more responsive than ever."



Jim Furgason (left) and John Leuthard (right) — Ceridian Corporation

Nobel Insurance: A plan for success

Wally Schlaegel knows his business—all seven of them. As vice president of accounting for Nobel Insurance Corporation, Schlaegel and the other company managers can quickly access financial information for any of Nobel's seven operating units, including a Bermuda parent company. But that wasn't always the case.

"We were running general ledger on an AS/400 and a LAN-based accounts payable system, from which we issued quarterly financial statements," he notes. "With all those companies and all the manual processing we were doing, it would have been impossible to go monthly." But waiting until August to get June's results was a stumbling block for managers who needed to act on those numbers. So the charge toward a new computing system—and faster information access—was on.

To empower managers at the world headquarters in Dallas and at the various companies, Nobel's management began searching for powerful end-user database querying tools, says systems manager

Paul Kessler. "We knew that client/server was the way to go," he states.

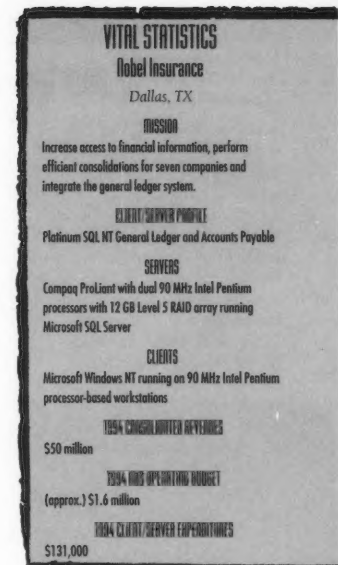
The company, which has \$50 million in annual revenues, was already following the Microsoft path, having recently standardized on Microsoft Office. Kessler says that narrowing the field of solutions was relatively easy since Platinum SQL NT from Platinum Software Corporation was the only client/server financial application based on Microsoft SQL Server and Windows NT.

The two-month countdown

After selecting Platinum SQL NT Accounts Payable and General Ledger for all seven Nobel companies, the team also brought in Compaq hardware powered by Intel Pentium processors. After an almost-record-breaking two-month implementation, the system went live in January, with the first accounts payable run. "We were able to do it in that timeframe," Schlaegel says, "because everyone was committed to the project. The most important thing we did was draw up our responsibility centers and our product centers. Once we did that, the chart of accounts was relatively easy."

Besides monthly financial reporting, the system neatly handles the intricacies of seven different operations. "We needed the ability to do domestic consolidation and carry that into foreign consolidation," says Schlaegel. "Because we have so many companies, we have a lot of intercompany transactions. Platinum offered the ability to do both."

Seven companies also require seven times the input, but Schlaegel estimates that the company has cut down manual entry time significantly: "Instead of setting up the vendors and accounts



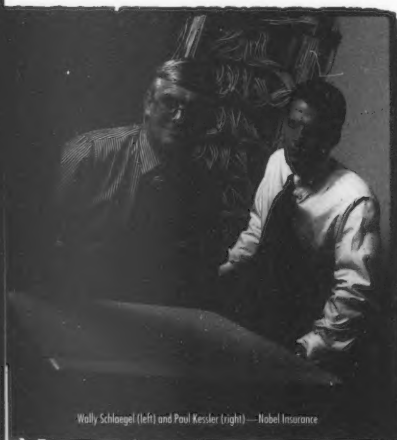
seven times for each of the seven companies, we set it up one time, and the other companies can access it."

Power to the users

Coming off the AS/400, performance degradation was a big concern. But with the Compaq ProLiant server running on two Intel Pentium 90 MHz processors, Kessler isn't worried. As he puts it, "With this much power, we're spoiling our accounting groups."

In addition to the Microsoft SQL Server 4.2 database and Windows NT workstations, Nobel's network also is strictly Windows NT. "You can't go wrong with Microsoft," Kessler says. "They're pointing the direction for the industry."

Pointing the way to Nobel's future is a new drive toward a completely automated general ledger system, linked to a client/server premiums and claims processing application. "We've made a lot of strides," says Schlaegel, "and we're very excited about what's still ahead."



Wally Schlaegel (left) and Paul Kessler (right)—Nobel Insurance

University of Virginia Health Services Foundation: New treatment for an outdated system

When Ruth Clowater and the finance staff at the University of Virginia's Health Services Foundation used to talk accounting tools, they were talking spreadsheets and highlighting pens.

"We did things the hard way," Clowater says. "We had to run huge reports, search them and use a highlighter for the one line we needed."

Clowater heads one of the Foundation's two accounting departments. The accounting systems for these two departments must communicate with each other and also with the university's massive accounting system. "We get a 6,000-line transaction from the university every month," she says. "It used to be a six-inch-thick stack of paper that we had to record manually. And we could only provide information in summary form."

When Clowater arrived at the Foundation three years ago, she found an eight-year-old LAN system. The system, which started on a standalone PC, had expanded to a 200 MB database running on a LAN. "The system was crashing every week, and I would spend hours restoring the database." Because the proprietary database often was corrupted, Clowater was forced to rely on outside

Finding a new accounting system for the Foundation wasn't easy. "I didn't find anything that seemed right," she says. "I was concerned about outgrowing Btrieve products, and the big systems couldn't give us what we needed. They were also cost prohibitive."

Small price for power

Clowater attended a client/server seminar held jointly by Microsoft and Platinum Software Corporation. "I had been looking at client/server systems and Platinum seemed to be the leader," she notes. "There really wasn't anything else to compare it to. It had the technology and power of a much higher end system, but because it was written for Microsoft SQL Server and Windows NT, I got a really powerful solution at a relatively affordable price."

Following a complete accounting overhaul, the client/server General Ledger system went live on July 1, 1994. Clowater credits the consultants with the smooth implementation: "You have to work with someone who knows client/server, and that's what IPC Technologies, an independent consulting firm in Richmond, VA, did for us."

She has high praise for Microsoft NT and SQL Server, as well. According to her, "I get a lot of information and I can control what users have access to. It's also very intuitive because it's GUI, so there's no need to know a long string of code. I can sit here at my desk and control most server functions without making a trip to the computer room. With SQL Server's dump files, the system backs up and dumps to another file, which is very easy to restore if necessary. Users can still stay in the system while I'm backing up,

so it doesn't interrupt their daily routines, and it only takes about eight minutes to do a 200 MB database."

Hardware that helps you sleep

She doesn't have to worry about hardware anymore, either, with the Pentium processor-based Compaq ProLiant. "The hot-pluggable drives mean that if we have a hard drive failure, we won't have to tear the box apart. You just flip open the front door, push a button and pull the drive out. Then you stick a new one in and it rebuilds the data on its own. I've never had to try it, but we have mission-critical software and we can't afford downtime. I sleep at night knowing it's there."

Most important, Clowater and her staff have thrown away the highlighters and are spending more time providing analytic reports and better service to the Foundation. The 6,000-line transaction from the university is available with the click of an icon, providing financial statement users with more detail than they ever imagined.

"A system is only as good as the information you can get out of it," Clowater says, "and we're providing financial managers with the details they want, anytime they want."



Ruth Clowater, University of Virginia

VITAL STATISTICS
University of Virginia
Health Services Foundation
Charlottesville, VA

MISSION
Update a decade-old LAN accounting system and provide detailed financial information to three separate accounting systems.

CLIENT/SERVER PROFILE
Platinum SQL NT General Ledger and Accounts Payable

SERVERS
Compaq ProLiant with dual Intel Pentium processors running Microsoft SQL Server

CLIENTS
Windows 3.1 and Windows for Workgroups running on PCs with the Intel 486 and Pentium processors



To learn more about
moving your financial system
to client/server with Platinum,
Compaq, Microsoft, and Intel,
contact **1-800-215-5550**
for the "Client/Server Financials:
The Revolution Begins" seminar
near you.

SPECIAL ADVERTISING SUPPLEMENT

REGISTER NOW FOR THE  IDC

PC MARKET

O U T L O O K

C o n f e r e n c e

Red Lion Hotel • San Jose, CA • September 19, 1995

Hot Topics

- Distribution Channels
- Global Customers
- Mobile Computing
- New Technologies
- Windows 95
- Worldwide Forecasts

Demos

- PC Pricing Normalizer
- Windows-Based PC Quarterly Tracking Product
- ResearchBase Delivered Via Lotus Notes

Industry Experts

IDC's best and brightest senior analysts from around the world will be on hand to speak on current issues and answer your questions.



IDC's 1995 PC Market Outlook is a one-day conference providing comprehensive market and technology forecasts, fresh primary research on emerging markets, access to IDC's expert analysts from around the globe, and a forum for discussion about the topics that matter to you.

CO-SPONSORED BY:

COMPUTERWORLD

**INFO
WORLD**

PC WORLD

REGISTRATION FORM

Yes, I want to register for PC Market Outlook!

REGISTRATION INFORMATION

Name _____
Title _____
Organization _____
Address _____
City _____ State _____ Zip _____
Phone _____ Fax _____

REGISTRATION FEE

_____ \$595 Full registration
_____ \$395 IDC clients

_____ I would also like to register for the FREE Breakfast Briefing:
*Positioning for Product Leadership: Benchmarking PC Reliability
and Services Performance*

FORM OF PAYMENT

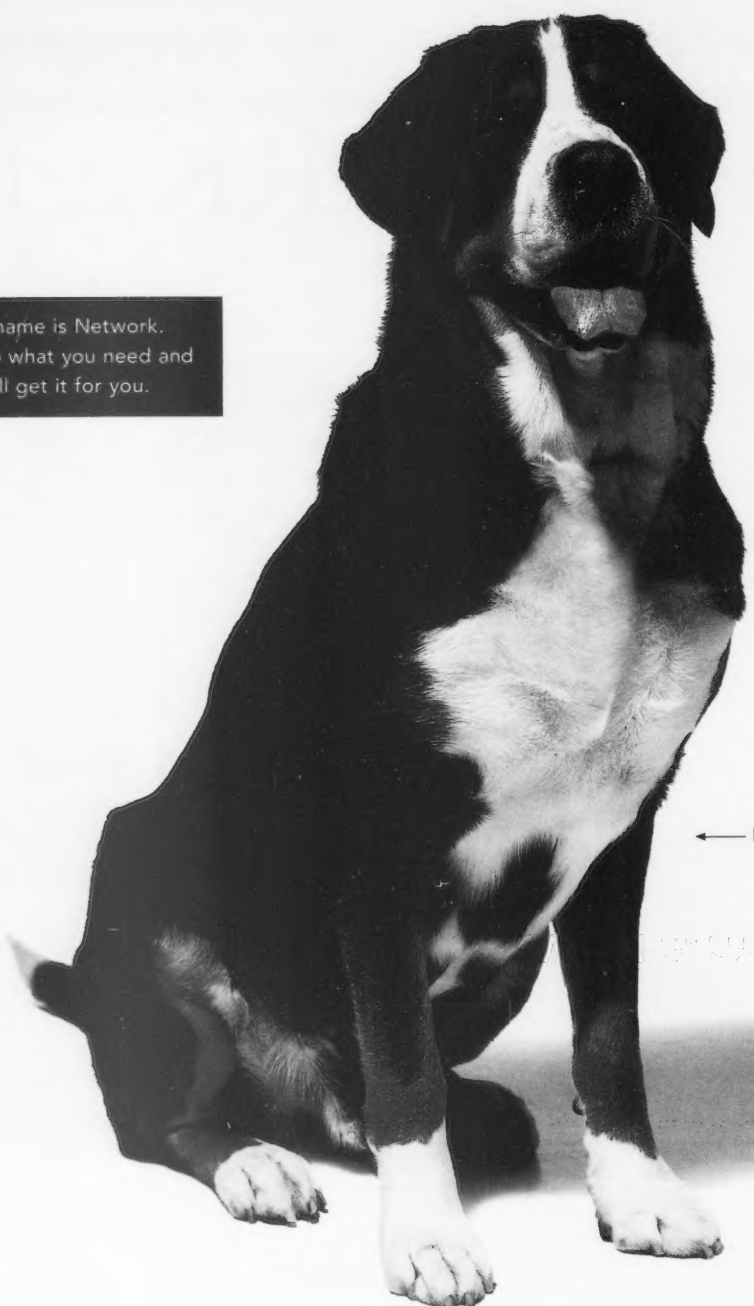
☐ Payment enclosed
☐ Please bill my credit card ☐ Mastercard ☐ VISA
Card # _____ Exp. _____
Signature _____
☐ Please bill my company P.O.# _____
(Payment must be received prior to attendance)

Please fax this form to: Dara Queen at (508) 935-4015



INTERNATIONAL DATA CORPORATION
5 Speen Street, Framingham, MA 01701
(508) 872-8200

M A G



His name is Network.
Tell him what you need and
he'll get it for you.

← Network

Think about all the different computers in your company. All the different hardware, software, and networks that don't even talk to each other. Now imagine being able to turn that bottled-up power into one worldwide network that makes your whole company more competitive. A network so powerful and so approachable that it becomes almost a living thing. That gets you whatever you want, whenever you want, without asking why. At Sun, we think that's the whole point of network computing. It may seem like a large promise, but it's one we've already delivered on, for some of the world's largest companies. And we can do the same for you. Because we have the hardware, the software, the support and the experience to make it all work. If you'd like to see what network computing can bring you, just contact the people who invented it. Sun. At <http://www.sun.com> or 1-800-786-0785, Ext. 250.



Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

Cramming for Win 95

By Jaikumar Vijayan

Some users are starting to lay the hardware groundwork for upgrading to Microsoft Corp.'s Windows 95—or even to other operating systems such as Windows for Workgroups.

For most shops, the overwhelming need will be for more memory and disk storage space. Analysts estimate that a majority of the installed corporate base has only about 4M bytes of RAM on their desktops and roughly 120M bytes of hard disk space.

Most observers say 8M bytes of RAM is the minimum requirement for Windows 95. The amount of hard disk space required depends on the number

of applications and whether the PCs are networked or stand-alone systems.

But upgrading from 4M to 8M bytes will be a time-consuming and costly affair and will cause some users to stagger their upgrade costs over a period of time. Costs for upgrading from 4M to 8M bytes of RAM are roughly \$150 to \$180 per PC.

"We have over 1,300 PCs, and the cost of upgrading all of them is probably not worth the

trouble of moving to Windows 95," said Frank Curley, assistant vice president at Astoria Federal Savings in Lake Success, N.Y.

The bank recently upgraded its desktop PC base to a standard 8M-byte RAM configuration. So instead of upgrading everyone again, the bank will

identify users who require additional memory and storage and upgrade only those systems when the time comes to migrate to Windows 95 sometime next year, Curley said.

Astoria Federal will increase its PCs' memory capacities with standard SIMMS (RAM chips) from the bank's primary vendors. Any additional disk storage requirements imposed by Windows 95 are unlikely to have an impact because most applications will be migrated to networked servers anyway, he said.

Brigham and Women's Hospital in Boston is already upgrading its hardware—but not for Windows 95. Instead, the hospital is switching over to Windows for Workgroups, said Jim Marra, a senior consultant in strategic technology assessment.

Midlife kickers for one-half to two-thirds of the hospital's

them run faster, pumping up memory to between 12M and 16M bytes of RAM and boosting hard disk capacity from 120M to at least 420M bytes.

Anticipation

"It's definitely going to be a 1996 decision," said Fred Deboer, director of network services at Advanced Technology Laboratories in Bothell, Wash. The firm estimated that it will spend between \$300,000 and \$500,000 to upgrade roughly half of the 600 or so mainly 486-based desktop PCs in the company.

That is a sentiment shared by Roger Thibodeaux, assistant vice president of information systems at the Connecticut Mutual Life Insurance Co. The com-

RAM, page 44



Moving on up
In preparing for Windows 95, users are considering the following:

- Buying new 486- or Pentium-based systems
- Upgrading or overclocking processors
- Adding memory
- Upgrading motherboards
- Adding disk space

4,500 PCs include clock-doubling systems that have 25- and 33-MHz processors to make

Gateway opens floodgates for slew of Win 95 notebooks

By Jaikumar Vijayan

In the first of what promises to be a wave of similar announcements soon, Gateway 2000, Inc. recently launched what it calls a Windows 95-optimized notebook computer.

Based on the Intel Corp. Pentium 75/90-MHz chip, Gateway's

Solo multimedia notebook features active-matrix screens, modular internal CD-ROM and floppy drives, lithium ion batteries, a docking bar and a keyboard optimized for Microsoft Corp.'s Windows 95.

The system, which will ship next month, starts at \$3,499 (\$3,699 with CD-ROM) and has a traveling weight of 5.6 pounds. It includes integrated stereo speakers, Soundblaster-compatible sound, jacks for external speakers, microphones and headphones.

The Solo's keyboard gives users shortcuts to running Windows 95 with two additional keys—one to open the Start menu

and the other to bring up a context-specific menu.

The keyboard is similar to the Windows 95 keyboard for desktop PCs.

"This will definitely open the eyes of the corporate buyer to Gateway," predicted Randal Giusto, an analyst at International Data Corp. in Framingham, Mass.

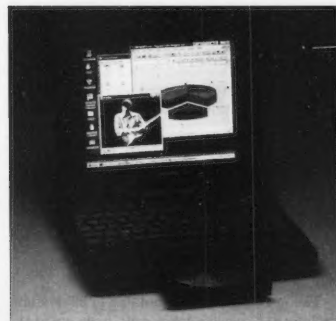
Giusto said this type of full-fledged multimedia notebook "will not be the corporate fleet-buy, nor will it be the office tool, but more of an executive buy."

Analysts predicted the launch of Windows 95 is also likely to trigger similar announcements from other notebook vendors.

Compaq Computer Corp., for instance, last week announced its new high-end Pentium-based LTE Elite 5000 series of multimedia-ready notebooks.

They will begin shipping next month, according to the company.

Notebooks



Gateway's Solo multimedia notebook features an active-matrix screen, Windows 95 keyboard

Microsoft's blitzkrieg

By Stuart J. Johnston

If you were a techno-dweeb who never really grew up and you ate too much ice cream before falling asleep, imagine what your dreams would be like.

How about a giant Windows 95 box sailing into Sydney Harbour in Australia with musicians and dancers? Cool, dude.



Or maybe you suddenly find yourself in Toronto, and one day a giant letter "O" appears on the top of the city's tallest building. Then every day thereafter, another letter mysteriously appears until the letters spell "Windows 95" on a banner 300 feet tall.

Or you dream you're a journalist in Poland being taken down beneath the ocean in a submarine "to show them what the

world would be like without Windows."

Or you snap on the TV in the Philippines and see the president, Fidel Ramos, receiving the first copy of Windows 95.

But wait, this is no dream. These are all events Microsoft Corp. will undertake as part of its worldwide launch of Windows 95.

In fact, as Microsoft rolled out its new desktop operating system last week—with a huge circus event on its Redmond, Wash., campus and satellite downlinks to 40 cities—the hype and hoopla were intense:

- In New Zealand, TV stations carried live the sale of the first copy of Windows 95 at midnight on Aug. 24.

- In Paris, a Windows 95 Car from Citroen, with logos on the side, was to pick up Microsoft Chairman Bill Gates at the Paris airport and take him to an event in the Palais des Congres.

- In Italy, Microsoft will distribute Windows 95 and Office 95 demo disks in railway stations and airports. Gates will launch the product on Lake Como on a boat flying the Windows 95 flag.

Talk about a blitz.



Desktop Computing

Win 95 install: Easy, but bumps possible

On-line help program addresses most questions

By Chris DeVoney

If first impressions are important, Windows 95's setup leaves a pleasant image. Windows 95 successfully ushers individual users through the extensive installation process and provides network administrators with helpful tools for single or multiseat rollouts. However, jumping the gun as a user or information systems group will ground machines on silicon shoals.

Microsoft Corp.'s Windows 95 is distributed in two primary packages—a CD-ROM and a set of 13 diskettes. As a bonus, a bounty of auxiliary information and programs are packed onto the CD-ROM, including a tour of features, a pinball game, additional systems drivers, the Windows 95 Resources Kit in the Windows Help format and administration tools such as the network setup utility.

Using understandable dialog boxes and plenty of splashy graphics, Setup comfortably shepherds users through the maze of options that install any of the optional components. Setup de-

fects most common equipment and correctly migrates most settings from old versions of Windows. However, some choices applicable to networks, such as locations of server-based mailboxes, can require information from in-house technicians.

Setup's on-line help answers most pertinent questions, which is critical because only three of the 120 pages in the introductory manual cover installation.

Answers to the complex issues must be found in the CD-ROM or printed version of the Windows 95 Resource Kit, a highly recommended purchase for any Windows 95 support person.

The placement of Windows 95 files, which can be installed over an existing Windows 3.1 directory or into a new directory, is a key decision. By installing Windows 95 into the same directory as the old Windows, Setup migrates all Program Man-

ager folders and icons into the new Start menu and Windows 95 can run the previously installed Windows applications. This strategy works best when you know that all needed Windows 3.1 applications

are known to run correctly in the new operating system.

To create a dual-boot system, Windows 95 must be installed into a new directory. The drawback is that Windows 95 ignores all pre-existing groups and application files. Old applications must be reinstalled to work with Windows 95.

Unfortunately, Windows 95 doesn't remember settings for a computer's own shared resources. This is annoying to those whose workstation is a mini-workgroup server because such shared disk or printer resources need to be re-established manually.

Quick trick

The time spent upgrading to Windows 95 ranges from 15 to 60 minutes and depends mainly on standard system performance items. On fast Pentium computers with active disk caches, Windows 95 installed into a clean directory in 12 to 20 minutes.

Installation on several 100-MHz 486DX4s took 18 to 59 minutes. A Compaq Computer Corp. Contura installing Windows 95 into a clean directory via a quiet Microsoft Windows NT network completed its task in less than 18 minutes. The longest time in the 100-MHz group (59 minutes) occurred when Windows 95 was installed into a pre-existing Windows for Workgroup 3.11 machine that supported more than 400M bytes

of application files.

Expect network installations to be faster than CD-ROM because systems gain five to 15 minutes by having the Windows 95 files expanded previously by the NetSetup program.

Windows 95 offers an arsenal of tools to network administrators. The NetSetup program on the CD-ROM conveniently decompresses and copies Windows 95 to a server for installation on other systems or shared use between systems.

Additionally, NetSetup guides administrators into constructing scripts used by Setup to control or automate any or all of the installation options. By turning off user input, the installation can be completely automated (except for issuing the Setup command itself).

Unfortunately, NetSetup runs only under Windows 95, not Windows NT, so files must be copied through NetSetup to any NT server via the network rather than any local CD-ROM. Also, a copy of the resource kit and a text editor are required to edit any installation script.

For IS departments, doing their homework, testing their applications and writing scripts will make the Windows 95 rollout quick and relatively painless.

DeVoney is a frequent reviewer, author and speaker on PC technology. He works in Seattle.

Expect network installations to be faster than CD-ROM because systems gain five to 15 minutes by having the Win 95 files expanded previously by the NetSetup program.



RAM

CONTINUED FROM PAGE 43

pany, with a fleet of around 2,500 mostly 486-based PCs, has no plans to move to Windows 95.

When configuration upgrades like memory or disk drive upgrades are necessitated by new applications, the company goes in for "after-market upgrades, or we limp along by doing things like redirecting drives to the LAN."

Unless users are considering putting off the migration to Windows 95 until well into next year, it might make more sense to upgrade now than delay much longer, analysts said. The current dynamic RAM availability crunch could push memory prices up in the next few months.

Windows 95

Though analysts recommend that users may be best served by going to their vendors for the memory and disk drive boosters, other sources include catalog vendors, resellers and third-party upgrade vendors.

Suppliers such as Reply Corp. in San Jose, Calif., are selling upgrade kits that users can plug into older systems. The firm provides complete Pentium motherboard-level upgrades for IBM ValuePoint and PS/2 systems and Compaq Computer Corp.'s ProLinea systems.

Others such as Autotime Corp. in Portland, Ore., specialize in recycling memory chips. For example, the company offers a product that recycles otherwise worthless old 2M-byte chips into 4M-byte modules at prices starting at roughly \$70.

NEC brings multimedia to businesses

Fills cheap PCs with features

By Jaikumar Vijayan

In what analysts perceive as an early attempt to push more robust multimedia capabilities into mainstream corporate PCs, NEC Technologies, Inc. this week will announce a line of aggressively priced business PCs.

NEC's PowerMate systems will come with all the bells and whistles that were recently associated only with the multimedia consumer market. The systems will replace the company's Image series as its top-of-the-line business offering.

NEC is the first major vendor to introduce a full-featured multimedia corporate lineup and could succeed in tapping into early corporate interest in multimedia applications.

Price lure

For users, the availability of relatively low-cost corporate multimedia systems such as these—a NEC 90-MHz Pentium system starts at \$1,729—could catalyze interest in applications such as videoconferencing and enterprise-wide corporate training programs, analysts said.

"By implementing the newest and most recent technology when the cost is negligible, NEC is demonstrating the viability of these applications" in corporate environments, said Joseph Ferlazzo, an analyst at WorkGroup Tech-

The new high end

Features of NEC's PowerMate series include the following:

- Pentium processor, 90 to 133 MHz
- 16M bytes of RAM standard, expandable to 128M bytes
- 256K-byte standard second-level cache
- Full-screen, full-motion video
- 64-bit PCI graphics
- Infrared data transfer
- Pricing starts at \$1,729

P6 plans

NEC last week said it plans to demonstrate a P6-based workstation at Comdex/Fall '95. The system, which will be aimed mainly at the compute-intensive scientific and engineering markets, will have an estimated starting price of \$4,000, according to NEC.

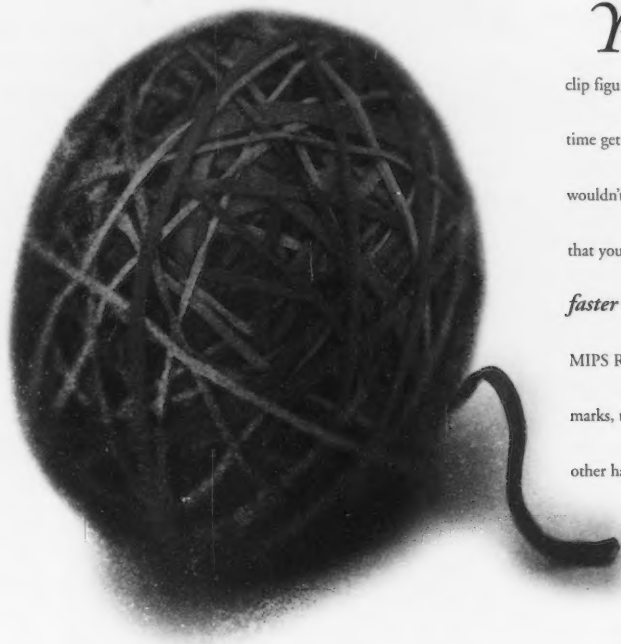
nologies, Inc. in Hampton, N.H.

At least one major NEC user agreed. Systems such as these "are perhaps not going to be our base systems, but there certainly are applications we could use it for" such as showing training videos and sharing voice and video clips companywide, said David Forfia, manager of information technology services at the electric utility department for the city of Austin, Texas.

NEC's systems are based on 75- to 133-MHz Intel Corp. Pentiums and include the following features:

- Full-motion Motion Picture Experts Group video.
- Peripheral Component Interconnect graphics.
- Quad-speed CD-ROM drive and 16-bit stereo sound.
- Infrared support.
- Built-in network support.

The systems will be available in 22 configurations and provide users with a choice of Microsoft Corp.'s Windows 95 or Windows for Workgroups.



*You could run
Windows NT without
MIPS, but there are
more imaginative
ways of wasting time.*

You could make rubber band balls for instance. Or little paper clip figurines. But why on earth would you want to spend more time getting less done at work? Well, the answer is you probably wouldn't. No one would. It's just that some people may not know that you can run Windows NT™ applications up to **three times faster** with a MIPS™ RISC-based system*. Or that you can also use MIPS RISC with UNIX. And that according to the TPC-C benchmarks, the **top three OLTP systems** use MIPS RISC. On the other hand, it may be that these people *do* know about all these things, and have just had trouble convincing other people. So if you find yourself in this position, and you think it might help, you could always tell them

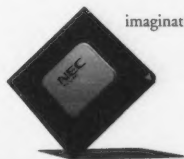
that you chose MIPS RISC because of its **exceptional price/performance advantages**. You might also tell them that you chose MIPS RISC because **nearly a hundred companies** have adopted its architecture and it's the **number one RISC-based general purpose processor** in production today.

That usually works. But if not – if after all that, they still seem unsure – just remember that you still have your imagination. And there will always be plenty of office supplies.



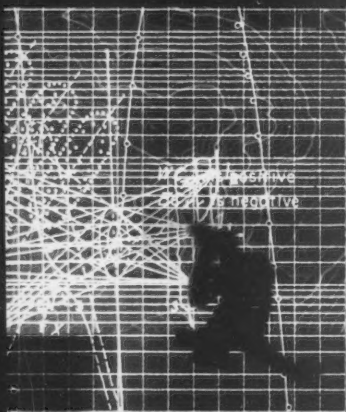
*Compared to a Pentium™ processor-based system

Copyright 1995 NEC Electronics Inc.
All trademarks are the property of their respective owners.



NEC

For more information call 1-800-366-9782 and ask for info pack #183.



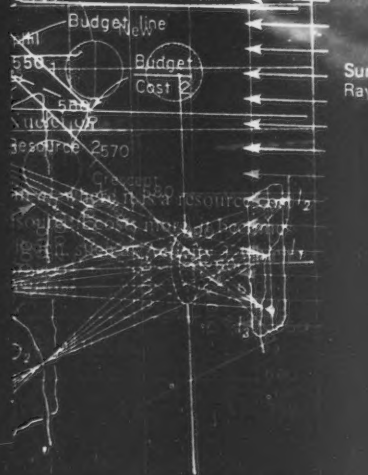
110 120 130 140 150 160
Mass number

Along a field. $+n$ (thermal)



Exposing determinations on wires with
frequency of 270 cps. A = 0 at % H,
B = 5.0 at % H, C = 7.6 at % H,
D = 1.0 at % H

Activity 3
0.520 / 0.000 Spectrum, Spectrum, Spectrum
0.520 / 0.000 Spectrum, Spectrum, Spectrum
0.520 / 0.000 Spectrum, Spectrum, Spectrum



monstration of depth of field.

PERFORMANCE TIMES ON PRO/ENGINEER v.3.4

ALPHASTATION 600 5/266 (L2)

88 sec.

500 R4400/200 (X2)

154 sec.

380-520-781

WE THINK IT'S
THE FASTEST
WORKSTATION
IN THE
UNIVERSE

Yep, we're positive: For demanding technical applications,

we've yet to see anything outperform the new AlphaStation™

600 system. Not from Sun. Or SGI. Or even HP's new

J-Class. It delivers our best performance ever in the ECAD/MCAD arenas.

And it trounces the SGI Indigo² running PTC's Pro/ENGINEER.¹

BUT GIVE US A
SECOND AND
WE'LL RUN THE
DATA AGAIN.

Our new PCI-based L-Series graphics accelerators offer

the fastest 3D performance in their price class. In fact, the

astronomical graphics-crunching power of an

AlphaStation 600 system is amazingly affordable. Check the data

yourself: Digital delivers industry-leading performance for less than our

THE NEW ALPHASTATION 600. THE FASTEST EVER.

competitors charge for yesterday's technology.

So if you're prepared to get more done in less time,



digital™

for less money, take a second to call one of our Business Partners.

Or call us at 1-800-DIGITAL. And be sure to visit us on the World Wide

Web at <http://www.digital.com>. Or send e-mail to moreinfo@digital.com.

©1995 Digital Equipment Corporation. Digital, the DIGITAL logo and AlphaStation are trademarks of Digital Equipment Corp. All other products are trademarks or registered trademarks of their respective companies. Based on Digital's internal testing. Timings are geometric means. Details available upon request.

AAY

INFORMATION SECURITY MANAGEMENT

**It *was*
overwhelming.**

Now it's consolidated.



Now you can easily manage security across your entire enterprise. Activate and deactivate users. Perform secured single sign-on. Or manage access to systems in your organization. All from one location. From one supplier.

By uniquely combining innovative security solutions, expert training and over 10 years experience, Mergent is the market leader in providing client/server security for Global 2000 accounts.

Worldwide, 1.5 million PCs are protected by Mergent's products. Included in this comprehensive offering are an Internet firewall, single sign-on, protection from weak NetWare™ passwords, UNIX system security, and the PC/DACS™ family of award-winning client/server security products.

Threats to your information have never been more numerous. Or complex. Fortunately, the solution is as easy as calling Mergent at 1-800-688-1199. Call today.

© 1995 Mergent International, Inc.
All product names are trademarks of their respective companies.

MERGENT
International 
Security Made Simple™

Mac users get peek at products

By Lisa Picarille

At the Macworld Exposition, held earlier this month in Boston, Apple Computer, Inc. gave users a glimpse of future system software as well as developer tools available now, while third-party developers offered up a mixed bag of products.

Apple showed off its work in progress on Copland, the next generation of the Mac OS, due out by the end of next year. It also offered previews of a new version of the operating system, due out this fall, for its Newton personal digital assistant.

The company announced it is now shipping OpenDoc Developer Release 3. Apple is expected to deliver the final version of OpenDoc, its object-based component architecture, this fall.

Now on sale

The Cupertino, Calif., firm also presented products available now. Apple teamed up with Digitool, Inc. to deliver an updated version of Macintosh Common Lisp. Version 3.0 of the programming language, which runs on the older 68040 chip, now lets multiple processes run concurrently within an application.

For developers who want to create applications that exploit the newest extensions to the Mac OS—including the ability to make three-dimensional applications with QuickDraw 3D—Apple released Issue 4 of the Mac OS software developer kit.

For their part, Macintosh multimedia developers can now find resources, services and help in creating products via Apple's Multimedia Program on the World Wide Web (www.apple.com).

For Macintosh users who want to get on the Web, Apple has shipped its Apple Internet Access Kit. In it, Apple bundles Netscape Communications, Inc.'s popular Web browser software.

Apple also reaffirmed its commitment

Macworld grab bag

Macworld Expo was the venue for a mixed bag of product introductions

New products and services from Apple include the following:

- A World Wide Web site of resources for multimedia developers
- Shipment of OpenDoc Developer Release 3
- Release of Version 3.0 of the Macintosh Common Lisp programming language
- Delivery of Version 4.0 of Mac OS software developer's kit
- Release 1.5 of Newton Toolkit
- Internet Connection Kit, which includes the Netscape Web browser
- Introduction of MacX 1.5 for running X applications on a Macintosh

New products from other developers include the following:

- SAS Institute announced that its SAS System integrated suite of software now runs on Power Macintosh
- Asante Technologies released a "fast" Ethernet card for PCI-based PCs and Macintosh
- Linksys introduced a new Ethernet workgroup hub with transceiver for the Macintosh
- Portrait Display Labs is shipping a 17-in. Pivot monitor
- Clone makers Power Computing and Radius cut prices on their Power Macintosh clones



BOB D'AMICO

to Unix by delivering an update of MacX, which lets Macintosh users run X Window System applications. Version 1.5 of MacX supports the X standard running on a Power Macintosh.

Third-party developers also introduced a slew of products at the show.

SAS Institute, Inc. announced that a new version of its SAS System, an integrated suite of productivity software, now supports the Power Macintosh.

Networking firms also chimed in with

products. Asante Technologies, Inc. introduced a 100M bit/sec. Ethernet adapter card for Peripheral Component Interconnect-based PCs and Macintoshes. Asante has reduced by 40% the price of its Friendly/Net adapter, which offers built-in Ethernet support. Also, Linksys introduced its first Macintosh offering—an Ethernet Workgroup Hub and Transceiver.

In other third-party news, Portrait Display Labs, Inc. unveiled two 17-in. color multifrequency displays that combine portrait and landscape views in a single monitor. The monitor costs \$1,295.

MACWORLD EXPOSITION

Macworld tests Mac OS vs. Win 95

By Lisa Picarille
BOSTON

■ Attendees at the recent Macworld Exposition were united by their love of the Macintosh and condemnation of Microsoft Corp.'s Windows 95.

T-shirt vendors hocking anti-Windows wares lined the streets leading to Boston's World Trade Center. Playing off the 1980s antidrug commercial, one T-shirt sported an Apple Computer, Inc. logo with the saying, "This is your brain." Under the Windows logo it read, "This is your brain on drugs."

Other shirts offered the sentiment, "I don't do Windows." And reinforcing Apple's 60% share in the education market, still another shirt read, "Macintosh: The

power to crush other kids."

Inside the Trade Center, Apple did offer serious, side-by-side comparisons of Windows 95 vs. the current version of the Mac OS. Michael Mace, Apple's director of Macintosh platform marketing, conducted a session called "Apple Assesses the Windows 95 Challenge." The session slammed Windows 95 for touting features—such as a trash can and long file names—that the Macintosh operating system has had for years.

Uptick expected

Joe Graziano, Apple's chief financial officer, said he expects a 20% increase in unit volume shipments for this quarter over the previous quarter. Graziano also said he expects unit volumes to be up 50% for the December quarter, compared with the same quarter last year.

Another company with high demand for its products was Power Computer Corp. The Macintosh clone maker's products were everywhere at Macworld Exposition despite the fact that it didn't have a booth.

Radius, Inc., another Macintosh compatibles maker, said it will likely be able to deliver a system based on the Apple/IBM Common Hardware Reference Platform (CHRP) before even Apple or IBM can get a CHRP machine to market.

But don't count on Radius' CHRP system to run Copland, Apple's next generation of the Mac OS, right off the bat.

Sources close to Apple said the Copland ship date has slipped from mid-1996 to much later in the year.

Apple is working on a version of System 7.5 that will run on CHRP in case Copland is late, according to Jim Gable, director of Mac OS licensing at Apple.



WHY NOT RUN THE DATA FOR YOURSELF.

ARROW ELECTRONICS INC. INTL SYSTEMS DIVISION 800-645-6530

AVNET COMPUTER 800-442-8638

GATES/ARROW DISTRIBUTORS 800-447-5270

HALL MARK COMPUTER PRODUCTS 800-927-3454

INTELLIGENT ELECTRONICS 800-800-4827

PIONEER 800-227-1693

TECH DATA CORPORATION 800-237-8931

TOTAL TEC SYSTEMS, INC. 800-634-2588

WYLE COMPUTER PRODUCTS 800-332-6995

digital



Introducing our new high-capacity, affordable storage solution: Travan™ technology. Use 3M Travan minicartridges to off-load little-used files. Archive old information. Transfer large documents. And back up critical data. The 400 megabyte (uncompressed) TR-1 minicartridge is only the beginning. As your needs change, Travan technology



*Travan drives available from
Aiwa, Conner, Exabyte,
HP Colorado, Iomega, Pertec,
Rexon and Teac.*

keeps pace, continuously expanding, with capacities to 4 gigabytes in the near future. It's one more reason why more businesses protect important information on 3M brand data storage products than any other brand in the world. To find out more, call 1-800-888-1889, ext. 2300. Or send e-mail to datastorage@mmm.com.

Expand your vision with Travan™ Technology.

3M Reliability

With over 2,000 exhibiting companies, 200,000 attendees from around the world, Technology Showcases on Communications, On-Line Services, Multimedia and OEM Sources, 100 cutting-edge conference sessions and keynotes from Bill Gates, Lou Gerstner and Bob Frankenberg
...what can COMDEX do for you?

COMDEX IT works for YOU

Updated Information and Registration

URL: <http://www.comdex.com:8000>

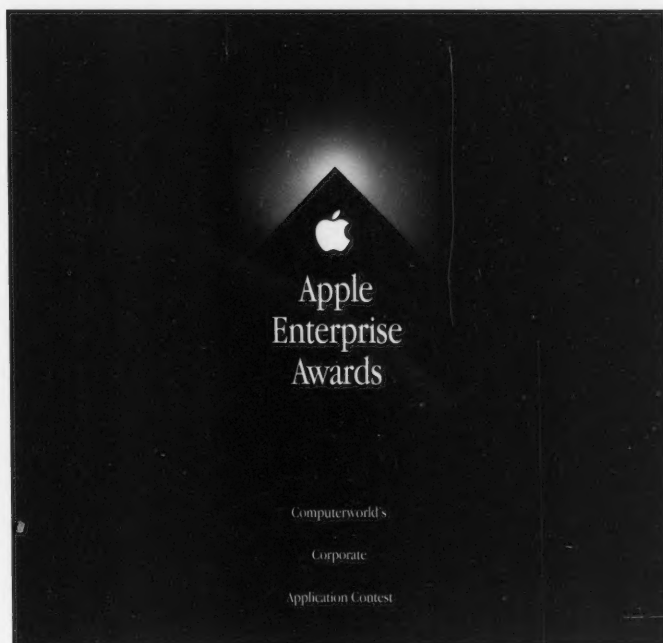
Go on-line to register or for the latest information on exhibiting companies, conference sessions and speakers, hotel and travel savings, and more!
Or register by fax! Call 617-449-5554, enter code 32, and have your fax number ready — we'll fax your registration form within 24 hours!

COMDEX®/Fall '95

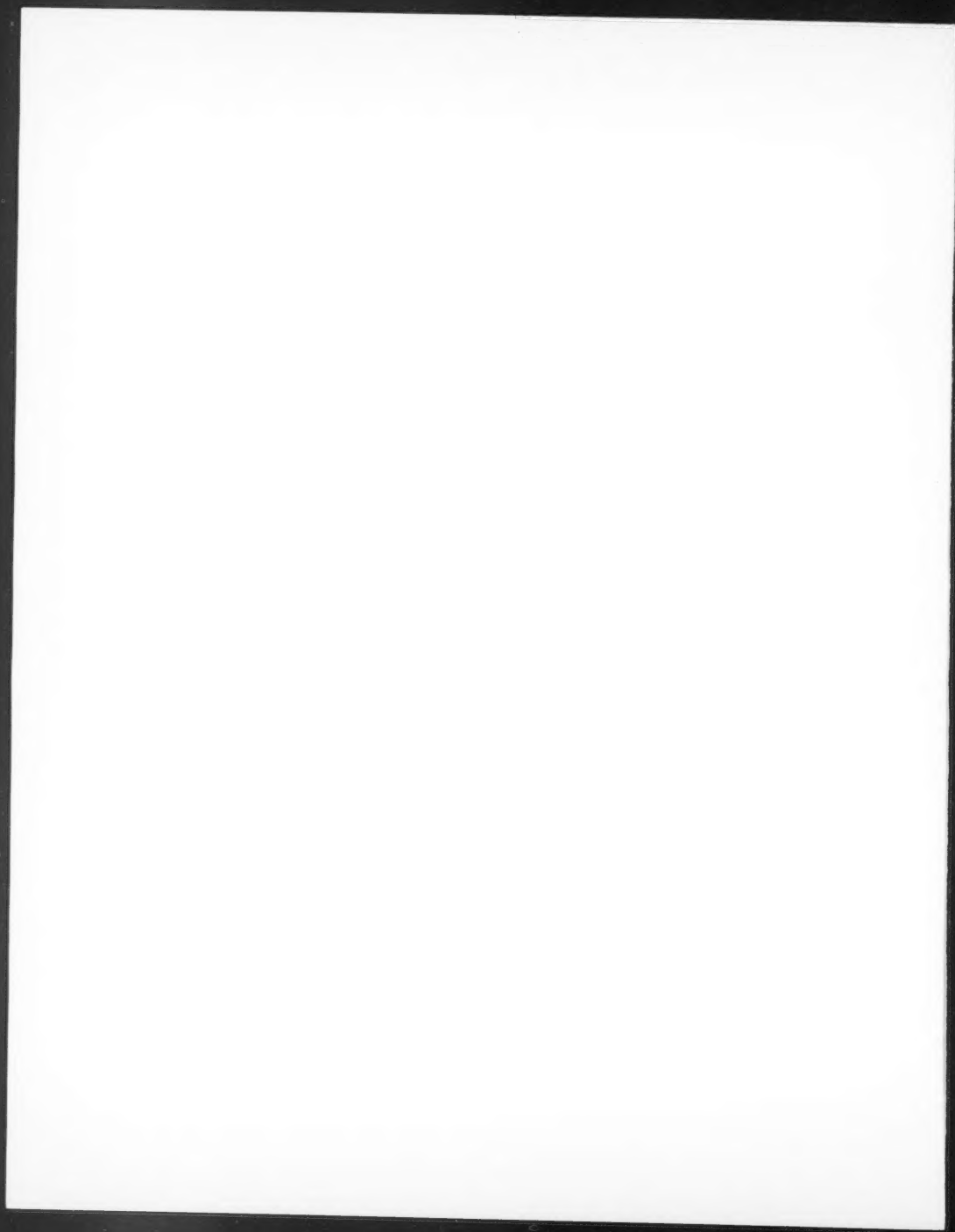
November 13-17, 1995 • Las Vegas, Nevada USA

**Register
today!**

1 9 9 5



RECOGNIZING EXCELLENCE IN ENTERPRISE SOLUTIONS



INTRODUCTORY NOTE



Creative and innovative software will never be the sole domain of commercial software vendors. Some of the most exciting and unique software is being created by and for the business, government and education communities to meet their own unique needs.

All too often, these in-house developers and solution providers do not receive the kind of recognition their efforts would earn in the commercial arena. This is the primary motivation behind the Apple Enterprise Awards, a joint effort by Apple and Computerworld to showcase the outstanding custom application development work being done on the Macintosh platform throughout the world.

Another purpose for the Apple Enterprise Awards is to clearly demonstrate the distinct advantages the Macintosh platform offers in addressing the most complex and intensive requirements of computing within large organizations. Supporting this community is the logical extension of Apple's long-standing goal of increasing personal productivity through superior technology.

The results of the program, as you can see from the detailed application profiles within, are remarkable. Without exception, these developers have had a major positive impact on the ability of their organizations to communicate and do business.

It was especially gratifying to spend time with the contest finalists, looking at their applications and seeing how they combined their own talent and experience with Apple technology to add significant value to their organizations.

I would like to extend my thanks to those who devoted the time and energy to participating in the Awards program, and encourage all of you working with the Macintosh platform to participate in next year's program.

A stylized, handwritten signature in dark ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

Michael Spindler
President and CEO,
Apple Computer

Lockheed Missiles & Space Co.

FINALIST: 1515 Machine 2.0.1



The Space Systems Division of Lockheed Missiles & Space Co., in Sunnyvale, Calif., is currently involved in the development of Space Station Alpha (both the U.S. and Russian segments).

The 1515 Machine is a server-based multiuser relational database that automates many of the tasks associated with generating cost data and Basis of Estimates (BOE) for proposal efforts. Several report options provide various views of the BOE cost data, down to the individual task level. Data can be electronically exported into enterprise-level pricing systems, or to local workstations where the data can be analyzed from within other applications.

The 1515 Machine provides a long-term solution to generating cost data efficiently for all proposal efforts within SSD. It also serves as a data collection tool for exporting cost data into enterprise-wide new business systems. The database demonstrates that workgroup-level tools can have a significant impact on a company's productivity and cost-effectiveness.

Contact: Greg Chirichigno at (408) 756-4001.

Northwest Airlines, Inc.

FINALIST: Aircraft Situation Display



At Northwest Airlines' System Operation Control (SOC) facility, several operations groups must make and communicate critical operational decisions 24 hours a day, 365 days a year.

Northwest Airlines developed Aircraft Situation Display (ASD) for Macintosh for its Minneapolis-based SOC facility. The application gives flight dispatchers a snapshot of a flight operation situation by depicting, in realtime, data critical to flight operations, such as current aircraft position, weather radar and significant weather information.

ASD is used primarily by dispatchers for pre-flight planning, route selection, following flights en route and alternative destination or diversion situations. Dispatchers can customize their displays to fit their particular work responsibilities.

ASD significantly enhances the collection and interpretation of crucial information through a single intuitive display. The application has resulted in major cost savings, cost avoidance, operational efficiencies and, ultimately, improved safety.

Contact: Bryan Bourn at (612) 727-6334.

Alex. Brown & Sons

WINNER: Alex. Brown Trading System



ALEX. BROWN & SONS
(INCORPORATED)

Alex. Brown & Sons is America's oldest investment banking firm, serving individual, institutional, corporate and municipal clients from offices throughout the U.S., Europe and Japan.

Alex. Brown operates the largest domestic floor trading floor outside New York City, processing thousands of transactions each day. In this fast-paced environment, traders require an information system that provides timely and accurate market data in a format that is easy to access and interpret.

Previously, the firm used a system that had been pieced together on multiple platforms, requiring traders to shift between five different screens, each with a different look and feel. The system was further hampered by outdated hardware and an unreliable communications backbone.

In 1994, the company moved to the Macintosh, citing ease of use plus the ability to integrate many services and all the off-the-shelf programs it could use for writing enhancements to its systems. "We compared Windows, Unix and Apple environments, and Apple was the easiest to use," says Robert Silbaugh, administrative manager for trading at Alex. Brown & Sons and also project manager for the Alex. Brown (ABS) Trading System.

The Macintosh-based system greatly enhances trader productivity. Through the integration of several disparate market data services running through Macintosh workstations, traders can now view, on one screen, all the information they need: market data, quotes, news, charts, historical data and databases. By eliminating the need for multiple workstations and shared devices, workplace clutter has been reduced. But the biggest benefit is that Alex. Brown can now help clients make decisions based on the most timely and accurate information available.

The system employs Apple Quadra 840AVs on the desktop and Quadra 650s in the computer room. On the Macintosh operating platform, Alex. Brown runs Novell, Unix, IBM and 486 Windows-based applications as well as its own custom programs.

Winning the award has had positive results, both internally and externally, for Alex. Brown. According to Silbaugh, "It has made the Macintosh more accepted within Alex. Brown, and it has given us recognition throughout Wall Street that this is truly a dynamic trading product."

Contact: Robert Silbaugh, (800) 638-2596, x 3369.



Development tools used by Alex. Brown & Sons

ADP/Market Max
Market Max v. 1
ADP/Market Max
NewsMax
Apple Computer
WinSnap 1.3
Apple Computer
Video Monitor
Berkeley Systems
AfterDark Screensaver
Farallon Computing
Timbuktu Pro
Insignia Solutions
SoftPC
Metrowerks Inc.
CodeWarrior
Microsoft
Microsoft Excel
Microsoft
Microsoft FastPen
Microsoft
Microsoft Word
Pacer Software
Pacer Term 3.0
White Pine
Exodus 5.1

San Joaquin Delta Community College

FINALIST: System 2000



The Computer Services Department of San Joaquin Delta Community College, in Stockton, Calif., supports the technology for all academic and administrative computer services.

In 1989, Delta College's 13-year-old mainframe could no longer meet the demands of college administration. The challenge facing Computer Services was to create an open computing environment, improve staff productivity in application development and revision, and deliver an easy-to-use solution that maximized the college's computer resources on the desktop.

System 2000 is an integrated, scalable administrative system that is designed for the Macintosh client/server environment. System 2000 integrates functions for managing student information, human resources and payroll systems. The student information system, which collects data on some 14,000 students per semester, is the largest and most complex component. More than 200 desktop Quadras and 27 Workgroup 80s provide staff with the computer power for System 2000.

Contact: R. N. Zinck at (209) 474-5300.

University of Texas in Austin

FINALIST: UTX Image View Client, UTX NW Image Server 1.0



The University of Texas in Austin is committed to using technology to provide information to its 48,000 students. That is why UT Austin, working with two outside developers, built a custom imaging solution based on the Macintosh-based Micro Dynamics document imaging system called MD MARS. The objective was to reduce storage space constraints, give staff instantaneous access to information, eliminate the problem of lost and misfiled documents, and allow staff to retrieve images from existing mainframe applications and route them to the appropriate area.

The system "image-enabled" the Software AG software used by UT and resulted in a custom client interface between the administrative computer system and MD MARS. The result is seamless communication between Software AG's Adabas database management system and Natural programming language, and MD MARS. Integration with the administrative computer system allows the university to maintain one database of information.

Contact: Shelby Stanfield at (512) 475-7310.

WINNER: WEST (Web Educational Support Tools) 1.0



Founded in 1851, University College Dublin is the largest university in Ireland, with more than 15,000 undergraduate students.

The Computer Science department designed WEST (Web Educational Support Tools) as a delivery environment for transmitting multimedia course materials to students over the World Wide Web on the Internet. WEST also creates the potential to deliver course materials to audiences outside the university.

WEST also allows tutors (in the U.K. educational system, someone assigned to a group of students to monitor their progress) to provide individual support to each student through the product's built-in messaging system. Students can submit exercises directly to tutors. Tutors can then grade the exercises, and return them, with comments, to the students.

In WEST, a Macintosh is used as the Internet server; the client can be a Macintosh, PC or Unix workstation. University College currently uses a Power Macintosh 8100 as a server.

The Computer Science department's first prototypes of WEST were not robust enough to use. That was frustrating, according to project manager Henry McLoughlin, because "we knew exactly the type of support functionality we needed, but did not have the resources to build it on."

But then, says McLoughlin, "two crucial things came along: the Web and AppleScript. The Web gave us the perfect client/server architecture. And AppleScript allowed us to install the functionality we wanted very quickly." From that point on, he says, the project took four months to complete.

WEST was designed as an in-house solution, but University College now intends to license it to other educational establishments — not just other colleges, but also the K-12 sector, according to McLoughlin.

WEST won the Apple Enterprise Award because "Apple technology was more critical for us" than for the other finalists, theorizes McLoughlin. "We could not have done our project without AppleScript."

When WEST won, McLoughlin says, "Needless to say, we were extremely pleased. But it also brought something interesting home to us. With the Internet, it doesn't matter where you're situated. You don't have to be at MIT or in Silicon Valley. Once you're on the Internet, where you are is the center of the universe."

McLoughlin says he hopes to enhance WEST with QuickTime Conferencing, which he is currently testing. He also hopes to get top-of-the-line Power Macintoshes to use in development.

Contact: Henry McLoughlin at +353-1-706-2480.



**Development tools used by
University College Dublin**

Apple Computer
AppleScript
Claris Corp.
FileMaker Pro
Cornell University
Win/UseMe
Net Communications
Netscape Navigator
Starnix Technologies
WebStar

Dartmouth-Hitchcock Medical Center

FINALIST: MacCIS



The Dartmouth-Hitchcock Medical Center (DHMC) consists of Dartmouth Medical School, the Hitchcock Clinic, Mary Hitchcock Memorial Hospital, the Matthew Thornton Health Plan and Veteran Affairs Hospital. When host-based clinical information was available only through terminal displays, a group of Macintosh users requested to use their computers to present and interpret this clinical information.

The response was to develop MacCIS, a client/server system that links staff physicians, remote affiliate physicians and other clinical staff members to DHMC's existing MUMPS data repository, while providing access to the patient electronic medical record. Features include identification of patient records in other physical locations on the LAN; quick identification of documents within the record; custom graphing of lab results for custom tests; and provider scheduling, on-call lists, and patient admissions and census. MacCIS benefits all providers involved while restricting access and safeguarding patient confidentiality.

Contact: Stephen L. Priest at (603) 650-5886.

Northrop Grumman Corp.

FINALIST: Integrated Graphics Communication System (IGCS)



Northrop Grumman Corp., in Pico Rivera, Calif., designs and manufactures military and commercial aircraft and assemblies, missiles and unmanned aeronautical vehicles, and electronics systems.

The Integrated Graphic Communications System (IGCS) is a multimedia Oracle database application that includes file cataloging, information management, job tracking, cost analysis and information routing software. The IGCS stores information such as digital photography, video, animation and audio files, as well as data, text and graphics files created in most desktop computer applications. Graphic files can be previewed in thumbnail form for quick identification, and documents are categorized in a document summary window.

Users of IGCS include office workers responsible for creating materials; researchers and analysts who need quick access to information; and executives who must review and approve work in progress.

Contact: Jeffrey Mirich at (310) 942-5160.

WINNER: Control Data Advisor



Control Data Systems Inc. is a systems integration company that helps businesses and government institutions couple business process improvement with technology innovation.

The company has developed a client/server application, called Control Data Advisor, that allows customers to seamlessly access corporate data in Oracle databases. The application, which supports project-based business, is electronic commerce enabled (E-mail, EDI, messaging) and can interface with accounting packages, HR applications and other systems. Its functions include project accounting, project management, time scheduling, time tracking, skills inventory and resource utilization.

Prior to the implementation of Advisor, financial and management information was available only on a monthly basis, and the information was locked away in proprietary databases. Now, all project team members who need to be in the financials of the project are electronically updated, so they can look online at costs, and forecast, in realtime, different costs that will come up. "There are no manual transactions through the departments anymore," says Todd Hauschildt, manager of electronic workplace implementation for Control Data Systems.

Implementing Control Data Advisor has led to early identification of schedule and cost overruns, enabling swift corrective actions, thus improving the quality of Control Data's project delivery.

Control Data Advisor runs on any Macintosh. The server is Unix- and Oracle-based, and the client part of the application runs on any Macintosh Classic and up.

Hauschildt believes Control Data Advisor won because "it is truly used on an enterprise-wide basis. It is used in 20 countries throughout the world, and it's part of our standard business system."

He adds, "It's a way to take a human interface and put it as part of a normal business system where everyone who originates the data is able to see the data and work with it and edit it all in one place, instead of having to mark up paper and hand it to an administrator."

After winning the award, "we've gotten more credibility as an internal organization," Hauschildt says. "The Apple technology has enabled us to apply our own messaging and electronic commerce technology to this product."

Contact: Todd Hauschildt at (612) 482-4917.



**Development tools used by
Control Data Systems**

Apple Computer
C
Apple Computer
C++
Apple Computer
Win Communications Toolbox
Apple Computer
E.T.O.
Apple Computer
Macintosh
Programmer's Workshop
Apple Computer
Object Pascal
Control Data Systems
EP/IX
Oracle Corp.
OCI
Oracle Corp.
Oracle PL/SQL
Oracle Corp.
SQL+
Sun Microsystems
Solaris

Pacific Northwest Laboratory

FINALIST: Ternary Waste Envelope Assessment Tool

**Pacific
Northwest
Laboratory**

Battelle, Pacific Northwest Laboratory (PNL) is a contract research organization in Richland, WA.

Much of its work is with the U.S. government, dealing with national environmental issues.

The costs associated with making and storing radioactive wastes from Hanford as glass logs in underground repositories amount to several billion dollars. The mixing and processing of the chemical mixture known as frit and waste (and a small volume recycle stream) must produce a glass product with properties acceptable for safely storing these wastes underground.

PNL is developing a set of analytical tools to help solve problems associated with the immobilization of these wastes. Ternary Waste Envelope Assessment Tool (TWEAT) mathematically combines user-specified waste, frit and recycle streams and evaluates properties of the resulting glass mixture. By allowing plant operators to compare different processing scenarios visually, thus minimizing the number of glass logs produced, TWEAT can save several million dollars.

Contact: Bob Robertus at (509) 372-4918.

Trilogy Development Group

FINALIST: Data Capture

TRILOGY

In 1993, Trilogy Development Group, in Austin, TX, released the first multi-vendor, multi-distributor product information and configuration system, call Conquer. But to become an industry standard application for computer purchasers, the system must contain every component from every computer vendor in the world. Data is difficult to collect and model — over 30% of the information on product data sheets is incorrect.

As a result, Trilogy developed Data Capture, a multi-user database that gives users an intuitive pathway to modeling products. With Data Capture, non-technical people can generate object-oriented models in seconds. Data Capture feeds all product information into Conquer, so buyers can use it to customize, comparison shop and order computer solutions.

Trilogy has used Data Capture to enter over 40,000 SKUs from more than 300 vendors and expects the number of SKUs to surpass 80,000 by year-end.

Contact: Jessica DiLullo at (512) 794-5900, ext. 263.

WINNER: AccuSource



Bergen Brunswig Corporation health care products and information services to 12,000 pharmacies and hospitals across the U.S. The company provides over 60,000 products for these customers' prescription drug and "over-the-counter" needs.

Differentiation in the mature and intensely competitive business of health care distribution can be a problem. Since each distributor provides exactly the same products, differentiation can only occur by adding value.

To provide customers with an electronic catalog containing tools that enable "best buy, best price" analysis, Bergen Brunswig developed a CD ROM-based system that it calls AccuSource. Before ordering a product, the customer can stock-check it in real-time for availability. The catalog also provides customers with digital photos of new products and informs them of products that are specially priced for the month. In addition, product manufacturers can use the system to advertise to customers through the use of digital movies, digital photos and voice-over techniques.

The system is deployed on an Apple Macintosh LC 575. Although customers could theoretically download the catalog to any computer with a CD ROM drive, it is specially configured for the LC 575. "We chose the LC 575 because of its design as an all-in-one platform," says Ray Pacitti, project manager, R&D. "Pharmacies don't have a lot of desktop space, so to have an external CD ROM or modem or peripheral would not be an effective use of space."

According to Pacitti, the AccuSource electronic catalog won in the Apple Enterprise Awards category for Communication & Collaboration because "it was the only business collaboration software application that was truly enterprise-wide."

Not only is the electronic catalog in production, Pacitti notes, "but it is also being used by more than 3,000 customers."

Each of those customers receives an updated CD ROM twice a month. Pacitti expects the number of customers to exceed 5,000 by year-end.

Contact: Ray Pacitti at (714) 385-4028.



Development tools used by
Bergen Brunswig Corp.

Apple Computer
AppleGuide
Apple Computer
Apple Media Tool
Apple Computer
PowerTalk
Apple Computer
QuickTime
Pictorius Inc.
Prograph CPX

CROSS PLATFORM

The Prudential Insurance Co.

FINALIST: The Member Services System, Version 4.50



The Prudential Insurance Co. of America uses the Member Services System (MSS) to provide instant access to customer support information during live telephone encounters. The system monitors and documents the progression of each call; routes unresolved issues through 13 divisions and tracks each open issue's status in realtime; and retrieves data from 11 host-based applications, using a local SQL database to decipher cryptic mainframe codes.

Prior to MSS, access to those 11 mainframe applications was cumbersome — each one required unique log-on procedures, used different non-intuitive navigation commands, and demanded re-entry of customer ID numbers and other data. MSS has enabled one-click access to any information an needed during a customer engagement, eliminated repetition, automated documentation, reduced "sensory overload" and simplified navigation. Because workflow is no longer dictated by the design of legacy applications, the customer support process has been streamlined.

Walt Disney Pictures & Television

FINALIST: Disney "RADAR"



Walt Disney Pictures and Television is a producer and distributor of feature films and television entertainment programs via the theatrical, broadcast, cable, home video and interactive markets.

Disney RADAR (Rights, Availabilities, Distribution, Analysis & Reporting) is a cross-platform, client/server application that tracks and manages all Disney film, television and home video titles for domestic and international markets. A mission-critical business and sales support system, RADAR maintains the Disney library of titles, their related contracts and legal rights, coordinates worldwide distribution and sales commitment, and calculates marketing opportunities for maximum profitability.

RADAR solved six business problems: how to manage a complex, voluminous and growing global product line; how to enhance profitability; how to coordinate legal and contractual implications; how to provide easy-to-learn, flexible access for multiple levels of users; how to extend worldwide connectivity to a centrally located server; and how to offer identical cross-platform access via Macintosh and Windows operating systems.

Contact: Gary Kleinman at (818) 558-2310.

Naval Air Systems Command

WINNER: Naval Aviation Wide Area Network (NAVWAN)



The Naval Air Systems Command (NAVAIR) and its affiliates, including the Aviation Supply Office, provide life-cycle support for all Navy and Marine Corps aircraft and related systems that can be operated, based and sustained at sea.

A large-scale reorganization and the widening geographical dispersal of NAVAIR caused a fundamental change in the way it did business. A robust communications infrastructure to enable cross-platform interoperability and access to databases, team members and customers worldwide was required.

"As you look at communications between all these groups, the cost of maintaining a team orientation was huge," says Commander Craig Luigart, director of strategic IS technology for the Office of the Assistant Secretary of the Navy for R&D and acquisitions. "There was a cry for some way to integrate all these people so they were looking at the same data. That was what drove the initial integration."

As a result, NAVAIR developed the Naval Aviation Systems Team WAN (NAVWAN), an enterprise-scale private network that integrates NAVAIR's 15,000 Macintosh computers and 25,000 PCs operating at more than 20 sites and across numerous operating environments. NAVWAN fulfills the requirements of the reorganization through: the integration of off-the-shelf products; providing a migration path to emerging messaging standards; and adopting a scalable network backbone.

The systems servers include both VAX and Macintosh platforms. "For senior managers, the Mac was easier to adapt to and a better fit with their logical understanding of their workspace," Luigart says. "The Mac became the lever to bring them into an integrated communications model."

Users of any of six off-the-shelf E-mail systems can access an X.500-like NAVAIR corporate directory of over 30,000 names. They can send and receive mail to corporate users and customers and to and from the Internet thru gateways. NAVWAN users can also attach binary files to mail messages and launch attachments from within individual mail applications (independent of platform). They can access corporate databases and file repositories independent of LAN operating systems or protocols.

Asked why NAVWAN won, Luigart surmises: "It took on an enterprise systems problem that dealt with a basic need: people being able to cleanly articulate and communicate data that deals with their day-to-day job, and attack that effectively, quickly and in a method not intrusive to the current environment that they already understood." Winning the award, he said, may help simplify a huge task: making NAVWAN the prototype for a national Navy infrastructure.

Contact: Commander Craig Luigart at (703) 697-3033.



Development tools used by Naval Air Systems Command

CF Software
QuickMail
Digital Equipment Corp.
Mailbox
Digital Equipment Corp.
Mailworks
Digital Equipment Corp.
Postmaster for
WINs and LANs
Digital Equipment Corp.
TeamLink Office
Lotus Development Corp.
ccMail
Microsoft Corp.
Microsoft Mail
Novell Corp.
GroupWise
Novell Corp.
WordPerfect Office to
Message Router Gateway

Medical Support Services

FINALIST: ClinTrak 1.0



For Medical Support Services, a Centreville, Ala., management company that provides health care management services to health providers across the U.S., tracking patient information is critical.

ClinTrak, a home health care application for visiting nurses, was developed to automate the capture of patient clinical data at the source — with the nurse in the home. Each day, the nurse links in to one of the company's satellite servers, sends patient information gathered from the previous day's visits, and retrieves the next daily schedule of visits.

On a typical day, each nurse visits up to six patients, using ClinTrak to record information such as vital signs and other clinical data; visit status, and reason for visit; medical supplies used; and mileage. ClinTrak not only eliminates many forms, but provides an electronic record for each patient that can be accessed remotely as well as on-site. Linked into the company's IS system, ClinTrak provides information for billing and patient tracking without the need for rekeying critical patient data.

Contact: Jeff Bauer at (205) 926-3700.

Zimmer, Inc.

FINALIST: Zimmer Information Console



Zimmer, a division of Bristol Myers Squibb, designs, manufactures and distributes orthopedic implants and related equipment and supplies. With its product line (over 10,000 products) and customer base both growing, Zimmer needed to re-engineer its information dissemination processes.

The Zimmer Information Console (ZIC) is an electronic catalog that serves as a sales force automation solution. ZIC provides detailed product information (text, video, graphics) in a mobile package. Product quotes can be generated and immediately printed or faxed via built-in fax modem. Product features can be demonstrated through QuickTime movies.

ZIC and its supporting graphic files are distributed on a CD ROM set that contains over 2,500 single- and multiple-frame QuickTime movies. Graphic files can be integrated into computer-based sales presentation applications, allowing a salesperson to customize and personalize multimedia presentations for a customer.

Contact: Tim Poyner at (219) 372-4223.

Centric Systems Corp.

WINNER: The Mortgage Market



Centric Systems Corp. has developed and deployed a decentralized distribution network for mortgage trading in Canada. The network allows consumers to place their mortgage demand up for bidding, through an intermediary, on a basis where lenders actually respond in competition with each other. The entire network rests on a standard EDI file and record bundle that allows the trading to take place across company boundaries.

The network provides a transaction-fee based "electronic marketplace" between decentralized point of sales and centralized underwriting facilities on a national scale. The network allows financial product suppliers and consumers to transact business electronically in a virtual business environment. Participants can be any licensed individual or corporation; trades can occur between any parties.

The mortgage process has become a commodity, and profit margins are eroding. The Centric solution addresses the traditional "fixed cost" branch office distribution system with its high overhead and inflexibility. "We build all the technology and provide it to the industry," says David Chapman, president of Centric. "We don't sell it to anybody. We just give it to them to use on a transaction fee basis."

Centric Systems began putting the concept together back in 1988. "We started with the Apple platform at the outset," Chapman says. "Because it is oriented toward point-of-sale, we found the Apple environment was far easier to work with. We can give it to someone who understands the mortgage business and a day later they can be using it effectively in the field."

Centric's stresses Apple technology in its network. "If someone wants to play with us, they must use an Apple platform as defined by us," Chapman says. "It must be precisely the Apple configuration we tell them to have for their circumstances, because we support the entire network electronically."

According to Chapman, The Mortgage Market won because it defies traditional thinking. The traditional thinking in financial institutions, he says, is "I will build technology for my institution alone, and I will use that to beat up the other guy. But this product not only gives the consumer and the independent business person a bit of influence, it's cost-effective and beneficial for the financial institution."

Chapman calls winning the award "an anointment." In the past, he says, Centric had not been part of the "institutional fabric" in Canada. But, he adds, "We'll do about \$2 billion (Canadian) in residential transactions this year."

Contact: David Chapman at (519) 649-2363



Development tools used by Centric Systems Corp.

Apple Computer
Apple Remote Access
Apple Computer
ARX Development Kit
Apple Computer
Win HyperCard
CE software
QuickMessenger
Parallon Computing
Timbuktu Pro
Hectect Software
CompileIt!
Hectect Software
PrintReport
Hectect Software
WindowScript
Oracle Corp.
Oracle 7 for AIX
Symantec Corp.
ThinkPascal

United States Surgical Corp.

FINALIST: Suture Label Approval Software



United States Surgical Corp., headquartered in Norwalk, Conn., is the world's largest manufacturer of surgical staplers. The company is also a leader in the field of minimally invasive surgery and a growing participant in the suture market.

Label artwork must pass stringent FDA requirements before being applied to products. But the request and review process was too costly in terms of time spent reviewing artwork, and review errors occurred too frequently.

Suture Label Approval Software (SLAS) is a document request and routing software system that lets multiple departments request, review and approve label artwork before it is applied to products. Approved artwork is then printed by the system to a robotic print-and-apply system designed for this process. SLAS sped up the review process by routing artwork to the appropriate department and decreased review errors substantially by providing comparison material and WYSIWYG review of artwork.

Contact: Scott Neufeld at (203) 834-5289.

University of Pennsylvania

FINALIST: Penn Printout Online



The Office of Information System and Computing produces the University of Pennsylvania's technology newsletter. The World Wide Web edition of the newsletter is called Penn Printout Online.

Penn Printout Online offers "anywhere, anytime" access to current and archived university computing information. It is accessible from a World Wide Web home page in four formats: PDF (Acrobat), HTML, PostScript and ASCII. The home page also provides a hyperlinked subject/author/keyword index to the current year's HTML files, a feedback form and a searchable ASCII archive going back to 1991. The URL is <http://www.upenn.edu/pennprintout>.

Penn Printout Online solved the university's problem of distributing information. Although the print version was distributed directly to faculty and staff, only through Penn Printout Online did it become feasible to potentially achieve total distribution to a changing student population of some 20,000 graduate and undergraduate students.

Contact: Edda Katz at (215) 898-1786.

WINNER: Second Look Computing (Arachnid)



Second Look Computing is the University of Iowa's campus-wide resource for instructional software development research, training and support. It allows students, faculty and staff members to create pages on the World Wide Web without having to learn HTML coding. Because it allows them to weave pages for the Web, its developer, Robert McBurney, dubbed it Arachnid.

Creating Web pages in pure HTML is a complicated process. HTML tags often do not translate visually into what a page will look like, and there are no OLE standards. "With HTML, it's a very inexact science," says McBurney. "It's impossible to visualize how it will look with other objects on the page. There is nothing that forces an author to write readable HTML."

Arachnid simplifies the process by removing the HTML tags from the process of Web page design. Through its drag-and-drop interface, Arachnid automates the process of defining a page's interactivity. Its "active" mode allows a user to preview a page's interactivity before it is converted to HTML. Arachnid only generates HTML codes when the page is converted for the Web.

According to McBurney, Arachnid may be the best tool for beginners designing Web pages. "It's the difference between letting them do 90% of their development work versus paying someone else to do it," he says. "Most people who use it have had their own home page on the Internet in one week." More than 15,000 people have downloaded Arachnid since it became available to anyone in March.

"The TCP control panel makes the Mac a no-brainer in terms of a machine for taking control of the Internet. You don't have to constantly make changes in system. It allows you to take for granted the ability to work in an authoring environment controlling multimedia file formats while maintaining your Internet connection," says McBurney, who works on an Apple Power Macintosh 6100 AV.

McBurney thinks Arachnid won this portion of the competition because "considering how hot the Internet is, anything that was geared as tool toward Internet had an advantage. And because Arachnid is a multimedia authoring tool, I can put together a whizbang demo application in no time flat."

Winning the award has been a big boost for Arachnid. "There's an unstated bias against products that aren't shrink-wrapped," McBurney says. "Winning will give Arachnid another level of legitimacy to help people take notice of it."

Contact: Robert McBurney at (319) 335-5194.



Development tools used by
University of Iowa

Allegiant Technologies
SuperCard
Information Workshop
PlacePicture

Win

Booz-Allen & Hamilton, Inc.

FINALIST: Knowledge On-Line Kiosk



Booz-Allen & Hamilton Inc., a management and technology consulting firm in New York City, developed a multimedia kiosk, to allow the collection and sharing of its best thinking around the world.

The Knowledge On-Line kiosk is used as an internal marketing/communications, awareness-building and training tool. It serves as the linchpin of Booz-Allen's campaign to kick off its Knowledge Program. Concept to global roll-out took four weeks.

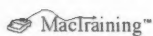
A team of four Booz-Allen consultants with limited multimedia exposure used off-the-shelf packages to implement the interactive self-paced program, which uses a variety of techniques, including 3-D animation, cartoons and QuickTime screen captures, to pass information on to users.

By generating excitement and buy-in for the entire program; providing a context for users to understand the program; and delivering an easy-to-use self-training vehicle, the Knowledge On-Line Kiosk has exceeded the firm's roll-out objectives.

Contact: Aron Dutta at (212) 551-6781.

MacTraining

FINALIST: LinkIT! 2.1



MacTraining is a company in St. Petersburg, Fla., that trains public school teachers to use Macintosh computers. The company teaches more than 80 Macintosh-related hardware and software courses, primarily at public schools but also inside corporations.

LinkIT! creates interactive multimedia standalones based on HyperText, buttons, cards, space and pop-up menus. Aimed at casual users, LinkIT! is the first Macintosh program that creates HyperText with no scripting. Its files can be self-running, can solicit user input, or can combine both. The package includes an interactive test maker, grade book program, sound recording section, color paint tools and QuickTime playback control. Links can also control audio CDs, laserdiscs and MIDI synthesizers.

LinkIT! has been used to test and place trainees, and to create supplemental support for hands-on training. Trainees prefer LinkIT! overwhelmingly compared to MacTraining's previous method of hard copy handouts.

Contact: Ray Horsley at (813) 528-0725.

Andersen Corporation

WINNER: The Andersen Window of Knowledge System



Andersen Corporation is the largest manufacturer of wood windows and patio doors. The company, based in Bayport, Minn., provides a range of consistent windows, door and roof window styles in standard and custom sizes.

The Andersen Window of Knowledge System was developed to support distributors and retailers in selling and quoting Andersen's growing product lines. The system, which replaces manual procedures, traditional catalogs and price books, is designed to support the sales and marketing efforts for use in Andersen's distribution system, as well as to publish product information and to simplify the process of specifying and quoting Andersen products.

The system currently runs on an Apple Power Macintosh 8100/100AV and is used by virtually all of Andersen's 100 distributors and 500 retailers. A portable version is also available; this version runs on the PowerBook 540c. The portable version is also used by 100 representatives inside the Andersen sales organization.

According to Robert Saxler, architect and application development leader, the Andersen Window of Knowledge System won in its particular application category because of "the depth of the solution. The toolbox we've distributed to our retailers not only supports the presentation of product information, but also the design and test of products.

"The Andersen Window of Knowledge is not a superfluous activity," he adds. "It is an integral method of delivering and selling products, and it has allowed us to increase the number of products we offer. We are now specializing products to customers' specifications, which supports the trend of mass customization."

According to Saxler, winning the award in the Multimedia Kiosk category for business "raises customer awareness of Andersen Corporation as an information-savvy partner in the construction industry. We're providing the information required to do business, whether that business is in the retail environment to sell our products or in the construction environment to have the accurate dimensional information required to install building products."

Contact: Robert Saxler at (612) 430-5110.



Development tools used by Andersen Windows

Adobe Systems
Adobe PageMaker
Adobe Systems
Adobe Photoshop
Allegiant Technologies
SuperCard
Apple Computer
MacApp
Apple Computer
M/W
Apple Computer
ResEdit
Blast Inc.
Blast
Heizer Software
CompileIt!
Microsoft Corp.
Microsoft Word
Oracle Corp.
Oracle for Macintosh
Oracle Corp.
Oracle Forms
Symantec Corp.
Think C

The City of Longview, Washington

FINALIST: Get in Touch



The city of Longview, Wash., has 35,000 residents and is the hub for activity in the state's Cowlitz County, which has a population of nearly 80,000. The challenge for Longview, was to find the most efficient way of providing a large amount of information to a large number of people at any time of the day or night. In the past, information about the area was available only during regular business hours.

Get in Touch, an interactive touchscreen information kiosk, now provides this information 24 hours a day at four locations. Over 1000 people now access information each month using Get in Touch.

The kiosk's intuitive menus and touchscreen technology allow users to select information by tapping buttons. A captivating combination of graphics, video and sound portrays information about Longview area attractions, business and government services in a manner that is both entertaining and logical.

Contact: Brenda Cooper at (360) 577-3350.

Honoka'a High School

FINALIST: Instant Interactive 1.0



Multimedia was getting more popular at Honoka'a High School, a K-12 public school on the Big Island of Hawaii. But after finding most authoring programs either too intimidating or not rich enough in features, the school had a custom application developed to meet its expanding needs for multimedia production.

The C++-based application, called Instant Interactive, made multimedia authoring quick and easy, allowing the school to create elaborate, fully interactive multimedia products without a high learning curve or a loss of complexity and visual richness.

After using Instant Interactive for a community history multimedia grant project about nearby Waipi'o Valley and Hawaiian culture, the school wanted to construct even more new and varied products. Now, Future-Farmer, Science Fair and History-Day statewide competitions, plus student-created library reference materials, can be multimedia creations. The Instant Interactive solution has allowed Honoka'a High to devote a new computer lab entirely to multimedia production for the next school year.

Contact: Kim Hunt at (808) 775-0995.

WINNER: Penn State Alumni Association Information Kiosk 1.0

PENNSTATE



The Penn State Alumni Association wanted to serve its members better, and thought that more high-tech visibility would allow it to do that. So the association decided to create an information kiosk that could serve as an easy-to-use, up-to-date information resource about the Alumni Association, Penn State and the local community.

The kiosk also helps the Alumni Association gain visibility so that it can increase membership, particularly among recent graduates and current students. The kiosk employs a playful graphical interface that entertains and engages the user.

Currently there are three kiosks that tell the Penn State story. The three are located at the Nittany Lion Inn (an on-campus hotel), the Scanticon Conference Center and the Hetzel Student Union. Although much of the information resides on the individual kiosks themselves, when additional data is needed, such as the latest weather forecasts, a kiosk can make a request to a network server, which retrieves data from the Internet, formats it graphically, and transmits it to the kiosk client which formats the information for interactive use.

The kiosk is built around an 8100/80AV Power Macintosh. All the video involved runs off the Power Macintosh's internal hard drive.

Eventually, there could be as many as 15 to 20 kiosks, situated on campus and around town, according to Thomas Flach, multimedia producer with the Multimedia and Emerging Technologies Group at Penn State's Center for Academic Computing.

According to Mike Halm, project manager for the Multimedia and Emerging Technologies Group, the kiosk won the award in its particular category because "it fit the enterprise model more. We were doing things with remote servers."

Another reason, he says, was that the kiosk used a lot of creativity to make it user-friendly. "We used a video guide who's something of a stand-up comic to usher people through the use of the kiosk."

As a result of winning the award, the Multimedia and Emerging Technologies Group has garnered some attention on campus. "We'll be doing some additional development on the project next year, trying to integrate QuickTime conferencing and some QuickTime Virtual Reality," says Halm.

Contact: Mike Halm at (814) 865-2159



Development tools used by Penn State Alumni Association

Adobe Systems
Adobe Photoshop
 Adobe Systems
Adobe Premiere
 Adobe Systems
CosmosAfterEffects
 Apple Computer
AppleScript
 Apple Computer
QuickTime MoviePlayer
 Atami Corp.
In Control
 Elastic Reality Inc.
Elastic Reality
 Equilibrium Technologies
Debabelizer
 Inspiration Software
Inspiration
 Larry Wall
Perl
 Multimedia Inc.
Director
 Metrowerks Inc.
CodeWarrior
 PhotoDisc Inc.
PhotoDisc

The type of solutions highlighted by the Apple Enterprise Awards program transform the personal computer from inanimate hardware into an integral part of the way an organization does business.

Developers rely on a rich set of tools to create such solutions. Since introducing the Macintosh, Apple has worked to guarantee that the broadest range of such tools are available for the Macintosh platform.

The state of Macintosh development has come a long way, with Apple pioneering concepts such as object-oriented programming, visual programming and component software. You see just a small sample of the current state of tools for the platform reflected in the software used to create the Enterprise Awards finalists.

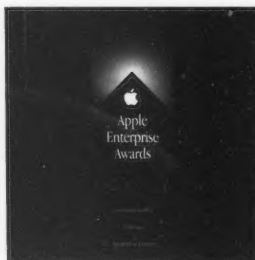
The growing need for feature-rich and custom software will catalyze dramatic changes in the way software is created, updated and used. On the development side, these transitions are being driven by:

- **Increased application complexity.** As software applications become increasingly feature-rich and complex, it becomes more difficult for developers to debug, maintain and improve them via traditional programming methods.
- **Proliferation of system software APIs.** The growing difficulty of implementing APIs across different computer platforms is making it harder to build programs that take advantage of new system technologies.

- **Multiplatform delivery.** Economic pressures are forcing developers to find inexpensive ways to deploy products across multiple platforms.

- **Need for more efficient programming.** Because of the shortage of qualified programmers, it has become more important to maximize programmer productivity and create easy-to-use tools for non-programmers.

One approach that can minimize these problems is "componentization" — the creation of industry standards that enable



software to be developed as modular, compatible building blocks. Widespread adoption of such a standard will make it easier for developers to create products, deliver software updates, keep up with hardware changes, and deploy content to multiple platforms. The component standard that Apple, IBM, Novell and other industry

leaders support is OpenDoc, an architecture that enables modular, cross-platform component software development.

Apple continues to extend the Macintosh software architecture and to "share the wealth" with developers. Apple's investments in emerging technologies and platforms will provide developers with new opportunities in the areas of PDAs, intelligent agents, 3-D graphics, video conferencing, interactive television access and online service navigation facilities. And as computer, television and telephone technologies converge, enterprising Macintosh developers will define and refine how these systems interact.

I N V I T A T I O N T O P A R T I C I P A T E

We welcome you to
participate in the Second
Annual Apple Enterprise
Awards.

Call 1-800-396-6877

Or send your request to
Apple Enterprise Awards,
c/o Janet Church & Associates, Inc.
101 Stewart St., Suite 300
Seattle, WA 98101
or
appleaward@jcai.com
to receive an entry kit
for the Apple Enterprise Awards 1996!



Apple Computer, Inc.
1 Infinite Loop
Cupertino, California 95014

Apple, the Apple logo, Apple Guide, HyperCard, HyperTalk, MacApp, MacBrowser, Macintosh, Movieshop, MPW, Newton, PlanTalk, QuickTime, and SADE are trademarks of Apple Computer Inc., registered in the U.S. and other countries. AppleScript, PowerTalk, ResEdit and SNAps are trademarks of Apple Computer, Inc. AccuSource is a trademark of Bergen Brunswick Corporation. The Andersen Window of Knowledge System is a registered trademark of Andersen Corporation, Bayport, MN. Computerworld, Inc. is an IDG company. All other company and product names are the property of their respective owners.



TEAMWARE MIXES
WORKFLOW WITH
GROUPWARE, 54

Workgroup Computing

LANs • Servers • Software for Groups

53

Workgroup Computing

Handle with care

Workflow systems must work with, not remove, legacy systems

By Tim Ouellette
SAN JOSE, CALIF.

Workflow systems often arrive when a company restructures its business process, but in almost every case the software still has to deal with legacy systems.

At Workflow '95, held here recently, users' experiences integrating workflow and legacy systems were a frequent topic of conversation. If not handled properly, the workflow systems installed today could become the bulky legacy systems of tomorrow, an industry watcher said.

Workflow software automates the movement of documents through an organization and usually involves mission-critical processes.

A representative from workflow software developer Viewstar Corp. said 95% of the systems the company installs deal with these types of legacy systems.

At TV Guide in Radnor, Pa., for example, workflow project leader Gregory Smith made sure the magazine's more than 50 Unix servers

and mainframes were considered before the magazine installed InConcert workflow software from the XSoft, Inc. division of Xerox Corp. The magazine wanted a workflow system to manage the production of more than 100 editions of TV Guide targeted at different viewing areas across North America.

Also, the software had to run with TV Guide's Oracle Corp. database because "we didn't want

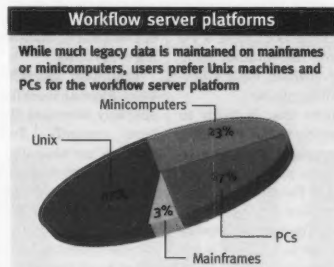
to spend any more money on database technology," Smith explained.

Obstacle course
But while the software dealt with the technological issues, the human issues could not be overlooked. The mainframe operators at first balked at the workflow software, saying they could manage the

10,000 different tasks associated with creating TV Guide.

"The operators were big obstacles until they were able to get their hands on the workflow," Smith said. "They wanted to put the book out;

Workflow systems, page 54



Source: Delphi Consulting Group, Boston

Protection guaranteed

Auspex's ServerGuard has automatic failover capabilities

By Jean S. Bozman
SANTA CLARA, CALIF.

When users work on a network, their data files may be stored locally or flung far across the country at a remote storage site.

But when a local power outage hits and the servers drop off-line, users are affected and business is disrupted — regardless of where the data lives.

Software protection

Hoping to address this problem, Auspex Systems, Inc. recently added software protection to its NS 7000 server line designed to restore data access with near-fault-tolerance.

The software option, called ServerGuard, provides automatic failover capabilities that connect users with alternate Network File System (NFS) file servers in case of outages. Although the switchover can be done in less than a second, resynchronizing two servers may take several seconds.

ServerGuard can also be used by sites that can't tolerate any interruption in the data access that feeds key applications such as finan-

cial trading and real-time manufacturing.

The Auspex software package, priced from \$15,000 to \$35,000, supports wide-area network software protocols and local TCP/IP LANs. Announced at a user meeting earlier this month, it is set to ship this fall.

Safe and secure

Users said they are pleased with the new failover capabilities because they often must access network data from multiple locations. NationsBank Corp., for example, has offices in Charlotte, N.C., and New York. The bank plans to link Auspex servers at both sites as part of an automatic backup system, and it will

Head to head

Auspex is a \$115 million firm that sells dedicated Network File System (NFS) data servers. They compete with off-the-shelf Unix servers from Sun Microsystems, Inc., Hewlett-Packard Co., IBM and \$15 million Network Appliance Corp. in Mountain View, Calif., which also sells dedicated NFS servers.

Auspex, page 57

Remote PCs part of DMI standard

By Steve Moore

Users last week expressed hope that additions to an emerging technical standard will give them a consistent way to track and manage hardware and software for far-flung PCs.

The Desktop Management Interface (DMI) standard has been extended to allow remote PCs as well as local, LAN-attached desktops to provide information about their hardware and software to management applications.

The Remote Desktop Management Interface (RDMI) allows management information to be transported between servers and remote PCs via any chosen communications protocol. It was designed to put an end to long-standing debates about the merits of competing protocols.

RDMI also provides "a single way of getting DMI information across the wire without having to worry about having separate [software] agents for each application to run," said Ed Arrington, chairman of the Desktop Management Task Force, the industry consortium that developed DMI and RDMI.

Some users welcomed the improved standard. RDMI "would be very helpful in providing a means to deal with remote site problems from our centralized help desk," said Ki Wilson, a senior microcomputer analyst at Stone Container Corp. in Chicago.

With Microsoft Corp.'s Windows NT and Novell, Inc. NetWare servers installed and more than 3,000 PCs to manage in 150 locations nationwide, Wilson said his company is "looking at using two different management packages." Those are Microsoft's Systems Management Server on the NT side and In-

tel Corp.'s LANDesk Manager on the NetWare side.

"It would be nice to share information between those two packages through the RDMI," he said.

Another user said the standard could help cut costs. Glenn Farrell, LAN systems coordinator at Firestone Textiles in Woodstock, Ontario, said RDMI support could

have provided "big-time savings" for him recently by eliminat-

ing the three hours spent working with two vendors to get Token Ring and PCMCIA cards to work in a Pentium-based PC.

While analysts hailed the RDMI specification, they faulted vendors for failing to make their PC products comply fully with DMI standards. The key question is "will

RDMI be another opportunity for [vendors] to diverge, or will it strengthen support for DMI and consistency in the use of it?" asked Jim Herman, a vice president at Northeast Consulting Resources, Inc. in Boston.

Another observer wondered whether the DMI improvements are too little, too

late. Microsoft recently decided that its products won't comply fully with the DMI specification. "In the meantime, companies like Compaq have come out with their own systems because DMI was so late," said Greg Lewis, president of the Personal Computer Assets Management Institute, Inc., a user group in Rochester, N.Y., that provides information about how users can manage technical assets.

"DMI could do what's needed," Lewis said. But he added that after two years of work, it is "unfortunately disintegrating into a number of different camps." Vendors are seeking competitive advantages rather than cooperating on one standard for managing PC assets, Lewis contended.



The RDMI allows information about hardware and software for remote PCs to be accessed by central management applications using any protocol across any network.

REUTERS

Workgroup Computing

Get your fax straight

Inbound fax routing to computers still poses implementation snafus

By Suruchi Mohan

Ask anyone about inbound routing and the answer is the same: The pleasure of having faxes delivered to your desktop comes at a price.

That cost is tallied in both dollars and in the difficulty of implementing the technology. Unfortunately for users, the situation hasn't changed over the past couple of years — a near eternity in the high-tech industry.

Outbound routing—or sending faxes from a computer over a network to a destination—has been fairly easy to implement and use. But inbound routing continues to be difficult. Three of the popular technologies for achieving it are direct inward dialing (DID), dual-tone multifrequency (DTMF) and optical character recognition (OCR).

DID stands alone

Apart from DID, most inbound faxing methods are "partial and require some manual intervention," said Peter Davidson, president of Davidson Consulting in Burbank, Calif.

Think of DID as a private branch exchange (PBX) for faxes. A trunk line comes into the fax server and is divided into several lines; each user gets a line.

This is a good solution for inbound faxing, said James Rafferty, technical editor of "Human Communications Digest," a quarterly standards newsletter in Danbury, Conn. "Its strong point is that it is backward compatible," which means it will work with any fax machine. "Its weakness is the cost," he

said. The high cost comes from installing phone lines and fax boards as more people are added to the system.

DID is also complex from the physical network standpoint, said Don Hammond, an information support specialist at Hewlett-Packard Co. in Loveland, Colo. "You have to understand how to configure DID with the PBX and set up the physical connection. You have to understand line voltages as you connect DID lines to the computer room,"

Dialing for answers

Direct inward dialing: Think of DID as a PBX for faxes. A trunk line comes into a fax server and is divided into lines for each user. Each trunk line is the equivalent of one fax machine.

Dual tone multifrequency: DTMF requires the sender to enter a code after the fax number. This is hard to use because users often don't know when to enter the code.

Optical character recognition: OCR is difficult with handwritten fax cover sheets. Even printed cover sheets are not always 100% readable.



he explained.

Still, users evaluating fax server technology seem inclined to go with DID. Garth Keesler, a staff consultant at Intergraph Corp., a computer systems vendor in Huntsville, Ala., said he would like "dual phone lines"—one for the phone and the other for fax. DID

will give him both.

Other methods of inbound routing, such as DTMF and OCR, aren't as popular or reliable. DTMF, or Touch-Tone dialing, requires the sender to enter the recipient's code after the fax number. But a lot of machines don't support the timing issues, for example, when the sender needs to enter the code.

A ways to go

OCR has made some strides in handwriting recognition, but it is still less than perfect in recognizing either handwritten or typewritten code on fax cover sheets.

Although she said she is excited about inbound routing, "OCR is low on our list," said Karen Dorrough, a PC analyst at Chevron Information Technology Co. in San Ramon, Calif. Chevron is piloting a DID project.

One development that is likely to take inbound routing to the next level is T.30 subaddressing, according to Ken Camarro, president of Camarro Research in Fairfield, Conn.

"The biggest impediment to LAN fax is addressing. Once [subaddressing] gets going, it will be a very powerful thing," he said.

T.30 subaddressing is a Telecommunications Industry Association

standard. It requires users to enter a code after the fax number. This code is transmitted to the receiving device during the "handshake." The downside is that the sending machine must be able to put the code into the handshake, and both devices must recognize T.30. Currently, many machines don't do this.

and manufacturing applications, because of their position at the core of many businesses, said John O'Connell, president of Wellesley, Mass.-based Staffware Corp.

"Legacy systems are usually robust and mission critical," he said. "Workflow automation without legacy systems is not an option."

Increased demand

Then there are cases where the replacement of computer hardware puts demands on workflow systems.

At Cigna Corp. Health Insurance in Hartford, Conn., Staffware's workflow software had to be configured to work with 10,000 older dumb terminals because the company considered the costs of replacing them all too high.

The system now handles 60,000 insurance claims a month and reroutes 15,000 special case claims that aren't handled by the regular workflow programs.

TeamWare mixes workflow with groupware

Challenges Notes by offering 'workflow in a box'

By Tim Ouellette
SAN JOSE, CALIF.

TeamWare, a division of UK-based ICL, has added a workflow module to its suite of groupware products, something Lotus Development Corp., Microsoft Corp. and Novell, Inc. have yet to fully address in their groupware plans.

By integrating workflow with groupware, users can let the software automatically route their work items to other users instead of manually routing everything.

TeamWare unveiled TeamWare Flow at Workflow '95, a sparsely attended show held here recently. TeamWare Flow is collaborative workflow software that works with TeamWare Office groupware and runs under a TeamWare Messaging Server. Workflow software automates the routing of work items through an organization and monitors the status of each item through the process.

The combination of groupware and workflow differentiates TeamWare and makes it competitive with Notes, said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston. "It is lower cost but not low-end stuff, though it is easier to use than Notes. Notes is not a workflow product," he noted.

Notes, unlike TeamWare, requires special programming or assistance from a consultant to develop a customized workflow system, he said. With TeamWare, users get the workflow out of the box.

Team members

TeamWare Flow includes a graphical planner, viewer, forms builder, document management and an application programming interface for developing custom applications. The server software runs on Microsoft's Windows NT with a SQL Server database or Sun Microsystems, Inc. Solaris 2.4 with Sybase, Inc.'s Sybase 10 database. The client runs under Windows or Windows NT.

Sakakeeny said the modular approach allows users to hook into any document management system. Previously, TeamWare Office users had to hook into workflow from an outside vendor—Staffware, Inc. in Wellesley, Mass.—much like Notes' approach to workflow.

The software provides flexible workflow that lets users change the process quickly, according to Paul Taylor, a product manager at Santa Clara, Calif.-based TeamWare. Every process managed by TeamWare Flow has an "owner" who decides what users have a right to alter the process.

TeamWare Flow is currently in beta-testing at a few selected sites and will cost \$495 per user. The product is expected to ship by the end of the year.



Brief

Prices guaranteed for RS/6000 resellers

Recognizing that IBM's new PowerPC-based desktops may depress pricing for PowerPC-based IBM RS/6000 workstations, an IBM executive confirmed the company will issue a pricing guarantee for its 500-plus RS/6000 channel resellers. "It's a price-protection plan," said Tom Jarosh, vice president of channel strategy and management at IBM's RS/6000 division in White Plains, N.Y.

Workflow

CONTINUED FROM PAGE 53

they wanted the responsibility."

With the workflow system installed, Smith said, training costs have been reduced for new operators: The system prompts them with a constant "to do" list. The client/server systems spread around the company are also used more efficiently, as InConcert routes batch process work to available computer resources instead of overloading one machine.

Using an off-the-shelf product reduced development and maintenance costs. "I could not do all this with programmers for the same price," Smith said. Maintenance is now only a fraction of a programmer's annual salary, he said.

Workflow can also be used to link vertical legacy systems, such as financial



"WHAT'S HOT TODAY CAN BE ANCIENT HISTORY TOMORROW. WE HAVE TO RESPOND INSTANTLY TO CUSTOMER DEMAND OR MISS THE OPPORTUNITY."

*Mary Evans, Vice President, Store Operations,
Babbage's Software Stores, NeoStar Retail Group*

MARY: "In this business, change is constant. Evolving customer preferences, new software releases, changing product inventories... staying on top of it all and keeping customers informed requires immediate access to the latest information. Our information system keeps it all at our fingertips."

PATRICK: "With Btrieve, we've built a client/server system that's more than flexible. From inventory control to store management and POS systems, Btrieve delivers rock-solid performance, it's virtually maintenance-free, and it's incredibly easy to use."

BUILT ON BT RIEVE

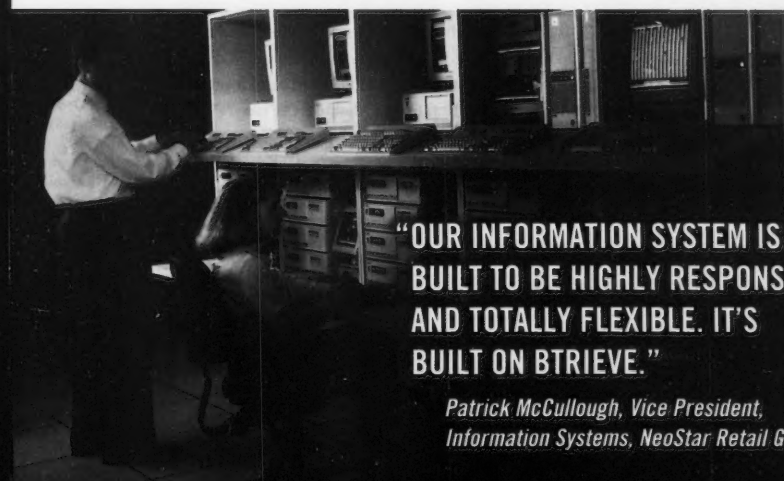
MARY: "The system is so intuitive, our store staff requires very little training. We don't even need the manual. This means our staff can concentrate on serving the customer rather than serving the system."

PATRICK: "As Babbage's grew to over 330 stores, Btrieve grew with us seamlessly. We see no limit for our company's future. And we see no limit for Btrieve."

For the complete Babbage's story, call Btrieve Technologies, winner of the 1995 RealWare Award at DB/Expo.

800-BTRIEVE
(512) 794-1719
CompuServe
[GO BTRIEVE]

IT SIMPLY WORKS
BTRIEVE
TECHNOLOGIES



"OUR INFORMATION SYSTEM IS BUILT TO BE HIGHLY RESPONSIVE AND TOTALLY FLEXIBLE. IT'S BUILT ON BTRIEVE."

*Patrick McCullough, Vice President,
Information Systems, NeoStar Retail Group*



Winner
**REAL
ware**
Awards

1994
PC Magazine Award
For Outstanding Performance



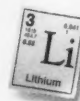
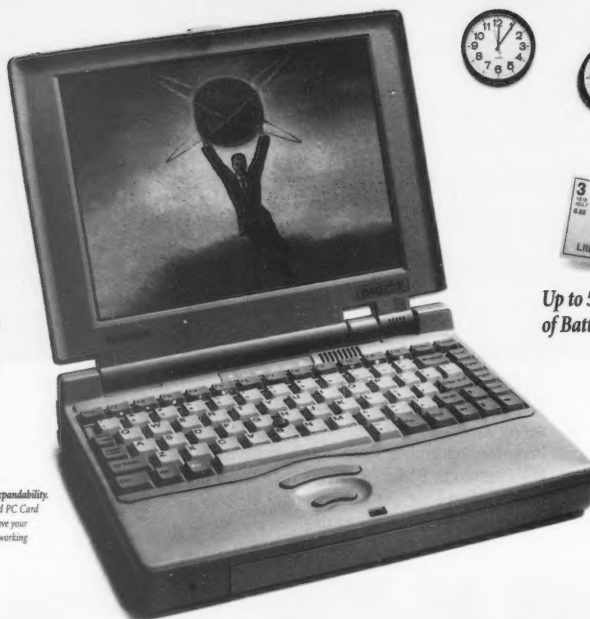
Toshiba Portégé Series
Outstanding Performance
Awarded September 1994



The Portégé legacy. The Portégé Series has won prestigious awards including PC Computing's Product of the Year and Portable MVP and PC Magazine's award for Technical Excellence.

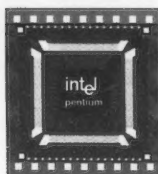


PC Card expandability.
Two stacked PC Card
slots (two Type II or one Type III) leave your
options for storage, fax/modems, networking
and the future wide open.



Up to 5 Hours
of Battery Life

MINIMIZE MASS.
MAXIMIZE ACCELERATION.



90MHz Pentium™
Processor

PORTÉGÉ 610CT

FEATURES:

- 90MHz Intel Pentium™ processor
- 9.5" dia. color TFT active matrix display
- Supports 24-bit true color (16.7 million colors)
- 720 Million Bytes (=68MB) HDD
- 4MB RAM, upgradeable to 40MB
- VLI local-bus video
- Integrated 16-bit Sound Blaster™ compatible sound system
- New enhanced Lithium Ion battery
- Two stacked PC Card slots (two Type II or one Type III)
- AccuPoint™ integrated pointing device
- External 3.5" 1.44MB floppy drive
- 4.8 lbs. - 9.9" x 7.5" x 2.0"
- Optional Port Replicator
- DOS, Windows® for Workgroups, MacTime™ Power Management and Fin-esse™ software
- Toll-free technical support — 7 days a week/24 hours a day

THE NEW ULTRAPORTABLE PORTÉGÉ™.

Toshiba engineers have done it again. Now you can get the incredible speed of a 90MHz Pentium™ processor in an ultraportable. The top-performing Portégé 610CT is packed with all the sophisticated features you'd expect in a full-size computer. A Lithium Ion battery provides up to five hours of use — without a recharge. Add to that, a spacious 720 Million Byte HDD, a large 9.5" diagonal color display, two stacked PC Card slots, a captivating sound system and an optional Port Replicator for one-step connection to your desktop. See how far Toshiba has taken every aspect of portable computing. And think where it can take you.

Call 1-800-457-7777 for more information or a dealer near you.



In Touch with Tomorrow
TOSHIBA

Toshiba. The World's Best Selling Portable Computers.

© 1995 Toshiba America Information Systems, Inc. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. The Intel Inside logo is a trademark of Intel Corporation.

New Products

Software Artistry, Inc. has started shipping SA-Expert Quality, a tool for facilitating communication among department groups.

According to the Indianapolis company, SA-Expert Quality gives support centers a mechanism to log, track and manage customer defect reports and enhancement requests.

SA-Expert Quality features automatic internal notification when an assignment has changed, automatic customer notification by fax or electronic mail when the status of a reported defect changes, flexible reporting and query capabilities and remote entry of defects and enhancement requests.

SA-Expert Quality runs on Microsoft Corp.'s Windows 3.1, IBM's OS/2 2.1 and LANs including Novell, Inc.'s NetWare, IBM's OS/2 LANServer and Microsoft's LANManager.

Pricing for SA-Expert Quality starts at \$15,000 for 10 users.

► **Software Artistry**
(317) 843-1663

Scopus Technology, Inc. has introduced SalesTeam 2.0, a software package that links sales process automation with corporate marketing campaigns.

According to the Emeryville, Calif., company, SalesTeam 2.0 gives sales teams, marketing departments and customer service departments access to sales data. It was designed to reduce sales cycles and highlight return-on-investment data from marketing campaigns.

SalesTeam 2.0 includes features for database marketing management and sales process automation. It lets users create marketing campaigns and manage sales cycles using shared databases of sales information.

Pricing starts at \$2,875 per concurrent user and depends on configuration.

► **Scopus Technology**
(510) 597-5800

Auspex

CONTINUED FROM PAGE 53

install ServerGuard this month after the software is beta-tested.

Even when power failures don't occur, ServerGuard will increase the flexibility of systems management.

"We can take part of the file system down for maintenance during business hours, which we could not do before," said Roland Voyages, vice president of technical services at NationsBank Capital Markets, Inc. in New York. The New York site has 120G bytes of data capacity on two Auspex servers. Another benefit, he added, is that client PCs don't have to be rebooted after an outage.

Jim Swanson, a vice president of information systems at CS First Boston's fixed-income trading unit in New York, said he wants to prevent server down-

Crystal Computer Services, Inc. has unveiled Crystal Info, a workgroup decision-support application.

According to the Vancouver, British Columbia, company, Crystal Info is a workgroup information system with data access and analysis capabilities. It features a distributed processing arrangement that removes processing from end-user systems and makes efficient use of system resources.

Crystal Info also features automatically scheduled report/query results. These results are made available to all members of the workgroup. Users can then use tools for drill-down, integrated graphing, data selection, sorting and totaling.

Crystal Info provides data access to a range of SQL and PC-based databases. It costs \$350 per seat.

► **Crystal Computer Services**
(604) 681-3435

FreeMail, Inc. has released FreeMail Internet 4.0, an Internet electronic-mail system.

According to the Bozeman, Mont., company, FreeMail Internet 4.0 can be used to set up private E-mail networks and multihop router networks. It lets users exchange Internet mail with people who have addresses on any commercial Internet provider. The only charges for sending and receiving messages through FreeMail's domain are normal telephone charges.

A single copy of the product is licensed to create 200 FreeMail Internet "children" copies, which can also send and receive Internet mail.

The product can also bypass the Internet and communicate directly with other FreeMail connections. Users can send large binary files or establish a secure and private communications link through FreeMail Internet 4.0.

FreeMail Internet 4.0 is available for Microsoft Corp.'s Windows, Windows NT and Windows 95 and the Macintosh. The product costs \$600.

► **FreeMail**
(406) 586-4200

time for financial traders. "It's the security of knowing that it's always going to be there," Swanson said of ServerGuard. "It's very nearly fault tolerance. The application on some other computer will not notice that the server has gone down."

Industry analysts said Auspex's sales are roughly 40% a year. Among the company's clients are Swiss Bank Corp. in Chicago, CS First Boston in New York and NASA's Johnson Space Flight Center in Houston.

Auspex is benefiting from the widespread trend of migrating from centralized mainframe systems to networks of distributed file servers.

"Their strategy is generally to drive their product to almost fault-tolerant levels, but you don't have to pay for all the redundancy in the file system," said Joe Clabby, director of transitional technologies at Aberdeen Group, Inc. in Boston.

IS bookshelf

► **Groupware: Technology and Applications** edited by David Coleman and Raman Khanna, 608 pages, Prentice-Hall, Inc., Upper Saddle River, N.J., \$48 (hardcover).

This book presents essays from some 20 experts about how to most productively use groupware in corporate America. The experts include hands-on practitioners in companies such as the Bank of Montreal, academics and consultants. The advice goes from the practical—how to implement Microsoft Corp.'s Access—to the theory of groupware.

forms (hardware and software) and profiles of different kinds of multimedia applications (education and training, reference tools). Perhaps not coincidentally, one of the two multimedia consulting firms the author profiles happens to be the one of which she's president. There is a resource directory and a glossary.

A CD-ROM is also included. It contains demonstration versions of 11 multimedia titles talked about in

the book.

► **Multimedia Networking** by Bohdan O. Szuprowicz, 261 pages, McGraw-Hill, Inc., New York, N.Y., \$29.95 (paperback).

This book explains how to network multimedia PCs and transmit data, full-motion video and CD-quality audio over LANs.

Compiled by Johanna Ambrosio.

FREE

MOBILE APPLICATIONS SEMINAR

Learn the latest information on developing and deploying applications to your mobile computer users in the field.

XcelNet® and Toshiba introduce the perfect way to improve your mobile business processes using RemoteWare®. Free seminars are being held in 36 cities, and we'll be in your area soon. The topic is hot, and the information is free. So reserve your seat today.

Call 1-800-322-3366

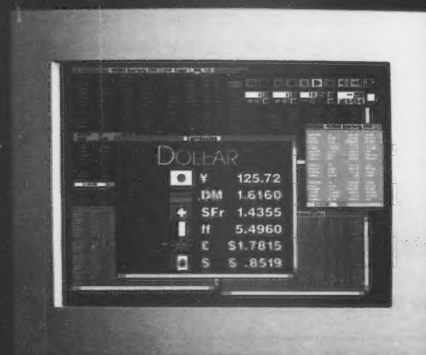


Working Smarter... Anywhere™

In Touch with Tomorrow
TOSHIBA



HOW WALL STREET'S SMARTEST BROKERS MAKE SURE THEIR INVESTMENTS NEVER GO DOWN



Imagine you're the MIS Director of a major Wall Street brokerage house. You know that your firm depends on instant access to ever-changing market information. Even minutes of downtime can cost the firm multi-millions in lost transactions. Make you nervous?

Not if you have a complete AT&T SYSTIMAX® Structured Cabling System (SCS) with our new multi-channel 384A Video Adapter. This affordable new adapter supports a minimum of 28 channels of broadband video with unmatched reliability. And since it does the job over Category 5 Unshielded Twisted Pair, you don't need to worry about installing coaxial cable.

**To run broadband video
over Unshielded Twisted Pair,
major brokerages depend on
ultra-reliable AT&T SYSTIMAX®
Structured Cabling Systems.**

As always with SYSTIMAX SCS, you get the dependability that comes only with the world's most tested cable products. Which means you'll be well prepared for any new applications now coming your way. What's more, there's the peace of mind that everything's backed by Bell Labs and that our manufacturing facilities are ISO 9001 certified.

So whether you're looking at a new installation or a retrofit—on Wall Street or off—make it future-proof with SYSTIMAX SCS. And with a certified installation, enjoy the protection of an unsurpassed 15-year extended product and applications assurance warranty.

For the resellers in your area who can bring you SYSTIMAX SCS, call 1 800 344-0223, ext. 5042. Outside the U.S., call 602 233-5895.

AT&T SYSTIMAX® SCS
THE LAST CABLING SYSTEM
YOU'LL EVER NEED



AT&T
Network Systems

INTERNETWORKING • SERVICES • NET MANAGEMENT

COMMENTARY

Internet security split

Let the browser beware

Steve Moore



So there you were in Rio on the last leg of your South American vacation. You got bored one rainy day, plugged your laptop into the hotel telephone line and soon were happily clicking through one of those new World Wide Web shopping malls.

You had to type some information about yourself into an on-line form before you could cruise the mall, but hey, no big deal, right? You skimmed through information about ordering CDs because you need to replace your worn out cassettes. And you couldn't resist clicking on a link to Chrysler's Web server, where you poked around to see if there was any information about the ultrahot Viper sports car.

You also wandered into an on-line newsstand, where your inaccurate mouse click missed *The Economist* and brought a pornographic magazine cover to your screen. Later, you used one of those Web-crawling search engines to find information about a new — and supposedly unbreakable — freeware encryption program. In fact, you found a Microsoft Windows 95 beta version and downloaded it.

Back home in Chicago a few weeks later, you got a lot of unexpected E-mail and snail mail. The surprise mailings included Chrysler sales brochures, offers for international travel packages and catalogs for pornographic CD-ROMs. You also got a stern written warning from the U.S. government about its prohibition on the export of encryption technology.

Virtual snoops

Welcome to the increasingly intrusive information age, in which cash is the enemy because it's anonymous. When you plunk down a stack of \$20 bills and walk out of a shoe store with a new pair of Italian loafers, no one captures any information about that transaction except the store, which knows that it sold a pair of size 10s for \$200.

But in the on-line world, you can bet your Ballys that most transactions that can be tracked will be tracked, after which information about them will be sold and resold. Entrepreneurs are already offering tools for monitoring and analyzing Web site usage.

For example, W3.Com in Palo Alto, Calif., now offers Web server visitor-tracking software that monitors visits

Moore, page 64

Lack of security is no obstacle

Gary H. Anthes



"French hacker cracks Netscape code," cried a headline in *The Wall Street Journal* recently.

The *San Jose Mercury News* also carried the story, which told how a French student broke the encryption protecting a secret message. The *Mercury News*

said the incident provoked "a chilling thought for companies aiming to do business in cyberspace."

Now, we journalists love to dramatize — not to say hype — but this is a bit much. Nothing the French "hacker" did should surprise or alarm us.

First the facts. Damien Doligez used 112 university computers in a "brute-force search" to find the 40-bit key needed to decode an encrypted message that had been posted on the Internet as a challenge to hackers. As everyone knows, toute la France goes to the Riviera in August, so the computers had a lot of spare cycles.

The encryption method attacked was RSA Data Security's RC4, which Uncle Sam has approved for export in its 40-bit flavor.

There are about 1 trillion permutations of 40 bits, enough to keep the computers busy for up to 15 days, Doligez estimated. One can almost imagine them humming the "Marseillaise" as they marched through the megabytes. But half way through, one of the workstations cried, "Eureka!" (or more likely, "Zut alors!"), and the job was done. Readers of the popular press were left with "chilling thoughts."

It is important to note that the student's method didn't discover some "master key" for RC4 but only the key used to encrypt the challenge message. Had Doligez wanted to go after other secret E-mail messages or credit-card transactions, the battalion of computers would have had to start over for every one. Soon his countrymen would have returned from the beach and given him the virtual guillotine.

Encryption? No way!

In the U.S., where the government's ban on the export of strong encryption obviously doesn't apply, encryption keys are much longer than 40 bits. Each additional bit doubles the difficulty of a brute-force attack, and so the risk in the U.S. from casual hackers or even pros with supercomputers is, as mathematicians like to say, "vanishingly small."

Indeed, for some commerce-minded Internauts, encryption just isn't needed at all. For example, the Internet Society, no less, takes unencrypted credit-card numbers from its members over the 'net for conference registration.

When I first saw that, I called Tony Rutkowski, executive director of the society, and asked him if that didn't give his members "chilling thoughts." "As it turns out, not a lot of people are concerned about that," he shrugged.

Rutkowski said most people view the risk of sending a credit-card number "in the clear" over the Internet as about the same as giving it out over the telephone.

There are serious obstacles to Internet commerce. Lack of security isn't one of them.

Anthes is *Computersworld's* senior editor, government and security.

IBM to gain SNA-to-NetWare gateway

By Bob Wallace

IBM is expected to announce shortly that it will take over development and technical support for Novell, Inc.'s NetWare for Systems Applications Architecture (SAA) LAN-to-host gateway product.

Under the arrangement, Novell would continue to market NetWare for SAA, according to sources close to the vendors.

"IBM is in the process of negotiating the deal, and it's 99% wrapped up," said one of the sources, who requested anonymity. "And barring a major unforeseen event, the agreement should be formally announced later this month."

NetWare is Novell's LAN operating system; SAA is a set of common interfaces that let users easily share and shuttle information among IBM mainframes, mini-computers and desktop systems.

This most recent twist gives IBM a solid gateway from SNA to NetWare, said one analyst who re-

quested anonymity.

Another analyst said the move would make good strategic sense.

"There's benefits for both vendors' customers," said Tom Nolle, president of CIMI Corp., a Voor-

others that are more widely used," he said.

Users want to see Novell turn its attention to other products.

"Novell is facing challenges to its core business, what with the rise of TCP/IP and the arrival of Windows 95," said Bill Horst, chief of the General Services Administration's communications branch in Philadelphia. "IBM can do more with NetWare for SAA than Novell."

Nolle said there is truth to the claim that Novell doesn't have what it takes to continue developing and supporting NetWare for SAA. "And it's very likely that IBM can expand the base of users for the product," he added.

One source said there is some overlap between NetWare for SAA and IBM's Communications Manager 2, which is an OS/2-based communications product that provides SNA gateway features and limited terminal emulation support. IBM won't stop selling Communications Manager 2.

The evolution of IBM's Systems Application Architecture (SAA)

March 1987	IBM formally announces SAA
May 1989	IBM demonstrates how SAA could work
February 1995	Novell announces NetWare for SAA
August 1995	IBM negotiates takeover of development and support for the LAN-to-mainframe gateway product from Novell

Sources: IBM, Novell

hees, N.J., consultancy. "IBM users will be most impressed because IBM has far more knowledge of SNA and SNA integration issues." Novell users, for their part, "will be happy because the company will be able to focus their resources on products that are evangelistic and

AT&T takes Internet plunge

By Neal Weinberg

By virtue of its size, AT&T Corp. has created a major splash with its recent dive into the pool of companies offering Internet business services.

Whether AT&T does a belly flop remains to be seen, analysts say, because the company's announcement was short on details, and the market for Internet commerce is still in its infancy.

But AT&T has joined Microsoft Corp., IBM, MCI Corp. and others as the players to watch in the emerging market of providing ways for companies to do business on the 'net.

AT&T has created three business units: AT&T WorldNet Services will give customers dial-up and dedicated Internet access; Hosting and Transactions Services will handle secure sales transactions; and Content Services will offer tailored information.

Technical trials of the dial-up service will begin within 60 days, and national availability of managed Internet access is scheduled for Sept. 1.

David Taylor, vice president of electronic commerce strategies at Gartner

Group, Inc. in Stamford, Conn., said AT&T is "serious about using the Internet as a major communications channel."

But until more details emerge on pricing and availability, the jury will remain out on whether AT&T will become

new arena that it is impossible to predict who the dominant parties will be. "We'll see a number of new players in the next few years becoming major forces in the industry," he said.

AT&T has an abundance of resources, but new companies will be able to compete on the basis of innovation, Krick said.

'net accords

AT&T's Internet service partners will provide the following:

NETSCAPE: Preconfigured browser

McKINLEY: Navigational tools

VERITY: Search agent

ADOBE SYSTEMS: Acrobat software for viewing, navigating and printing text and images

a dominant player, he said.

"It's like a land rush out there," Taylor said. But, as history teaches, "just being there first to settle the territory doesn't mean anything; someone is going to come along and shoot you."

He said the race will be won by "who's got the fastest wagon and who's got the most horses." And that puts AT&T in an advantageous position.

But John Krick, senior analyst at Datapro Information Services, Inc. in Delran, N.J., said the Internet is such a

Just a toy

Taylor cautions that despite all the hype, the Internet will be only one channel for doing business. He explained that the Internet reaches large numbers of people but not necessarily the right people demographically.

"For most people, the Internet is a research tool and toy but not something to do serious business over. Everybody I talk to is reluctant to commit a lot of data to traveling over the Internet," Taylor said.

Before companies risk putting sensitive information on the Internet, a service provider will have to step up with an ironclad guarantee that the data will be safe, Taylor said.

Even then, many companies will want to create their own private networks for dealing with customers.

3-D banking hits the Web

By Thomas Hoffman

Call it a virtual bank branch minus the brick and mortar.

That is what Visa International, Inc. and Worlds, Inc. began creating earlier this month for Visa's 19,000 member banks.

Using Worlds' Virtual Reality Modeling Language+ software, the firms are developing a three-dimensional representation of bank branches.

By the end of the year, on-line consumers will be able to tap into these branches to check account balances or conduct interactive chats with loan officers.

The Electronic Courtyard, as the system is called, will also allow cybershoppers to view and purchase retail merchandise over the World Wide Web. Visa's remote bank-

ing subsidiary, Visa Interactive, will link banks, merchants and on-line consumers and handle the back-end transaction processing.

Electronic commerce will be secured through the 3-D exchanges using the Secure Transaction Technology specification that Visa is expected to publish with partner Microsoft Corp. next month [CW, July 31].

While on-line banking should appeal to institutions trying to reduce or eliminate the costs of traditional branch banking, it is unclear whether the Visa/Worlds initiative will gain widespread acceptance among Visa member

banks or merchants. "You have to be a part of Visa Interactive or The Microsoft Network," said Bill Randle, director of marketing and strategic planning at Huntington Bancshares, Inc. "I think there are a lot of banks that won't participate in that closed environment."

A Visa spokesman said the company briefed representatives of its Top 100 member banks about its virtual banking initiative earlier this month. However, he declined to disclose which member banks or merchants — if any — have agreed to post a Web page on the Electronic Courtyard.

Banking dichotomy

Meanwhile, banking experts are divided on whether historically conservative banks are ready to make the leap to 3-D.

"Banks are just getting used to the idea of electronic commerce taking place over networks they don't own. 3-D banking isn't even in its infancy yet. It's embryonic," said Mark Hardie, a technology analyst at The Tower Group, a Wellesley, Mass.-based financial services technology consultancy.

But Richard T. Griffith, a former Bank of America executive, disagreed. "The wise banks are going to dramatically overhaul their traditional delivery mechanisms," said Griffith, a principal at Griffith & Associates, a San Francisco-based banking consultancy.



Visa and Worlds' Electronic Courtyard will let cybershoppers do banking as well as purchase retail merchandise

banks or merchants.

"The biggest problem I have with what Visa and Microsoft are doing is that they're creating closed systems —

http:

The World Wide Web, like other human communities, is not color blind. In fact, the Web sports many sites dedicated to specific ethnicities as well as to more general minority groups. Here are a few business and technology sites aimed at women and minorities.

New on the Web is Digital Women's site at <http://www.pmedia.com/cybergirl/dw/dw.html>.

Digital Women is a New York-based nonprofit group that provides women and girls with technology equipment and training. The group is looking for donations of used computers and volunteers to teach seminars.

Check out <http://www.sdsu.edu/wit> for the Women in Technology Directory, a listing of names, numbers, areas of expertise and other pertinent data on women in IS, engineering and other technical fields. Looking for female Unix programmers with experience in the financial services industry with whom to share war stories? Start a search here.

Web India at <http://www.webindia.com> is a well-constructed site aimed at business and technology related to India. Information on business and technology opportunities in India as well as Indian-owned companies worldwide resides here.

Comline Business Data runs a daily news service that reports on the high-tech and financial industries in Japan. See <http://www.twics.com/~comline/home.html> for reports on how many Japanese homes have PCs and what they do with them, the latest products from Japanese computer makers and many other topics. English-Japanese translation services are also available.

The Asian-American Business Association (AABA) at <http://spidey.usc.edu/~milanie/aaba> was created to help Asian-American college students prepare to enter the business world. The site is thin on content, but it should be enhanced once the school year starts in September, AABA officials said.

A group of Chinese networking professionals started the Chinese Information and Networking Association in 1992 to swap shop talk. Since then, 300 people have joined, according to the group's home page, at <http://www.aimnet.com/cina/cina.html>. The group arranges all manner of business and IS seminars and occasionally lists job openings at Silicon Valley-area companies.

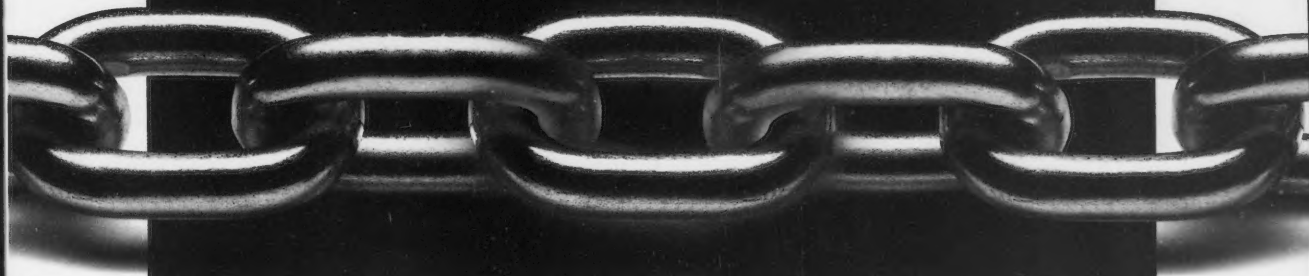
At the National Black Data Processing Associates' site, users can tap into the 20-year-old group's extensive calendar of events related to furthering the IS careers of minorities. The site, at <http://www.ileland.stanford.edu/group/bgsa/bdps/bdps.html>, also holds information about the group's nationwide network of bulletin boards.

For black entrepreneurs and small business owners, MelaNet at <http://www.melanet.com/melanet> is worth a cruise. The site was built to help black-owned businesses market products. It also houses reference material and demographic information on blacks and links to other black-oriented sites.



Netscape Server Software.

**The internal web
that hotlinks your sales team
to the latest news, forecasts,
and hottest sales leads.**



INTRODUCING SECURE, OPEN SERVER SOFTWARE FROM NETSCAPE. Now, within your organization, you can create a company wide web for publishing information online. And, with hyperlink technology, your people can connect to information with a simple point and click.



Netscape software includes encryption technology to protect your work. Also, Netscape Servers are based on open industry standards and are available on Windows NT and across UNIX platforms from AT&T, Digital, Hewlett-Packard, Silicon Graphics, and Sun. So, if you want your people totally connected, don't just wire their computers: Hotlink their information.



NETSCAPE

Call us at 1-800-409-6224. Or see us at <http://info.netscape.com/cw1>

©1995 Netscape Communications. Other tradenames referenced are the property of their respective owners.

You have impossible IT goals.

You need leading-edge UNIX
servers to reach them.

What computer system do you have?

The HP 9000 Server family is the broadest line
of compatible, scalable UNIX® systems on earth.

The new addition of K-Class Servers sets even

higher standards for open computing. And

HP-UX 10.0, the latest release of our enter-
prise class operating environment, makes

all this power infinitely more usable.

If the business decisions are yours,
the computer system should be ours.

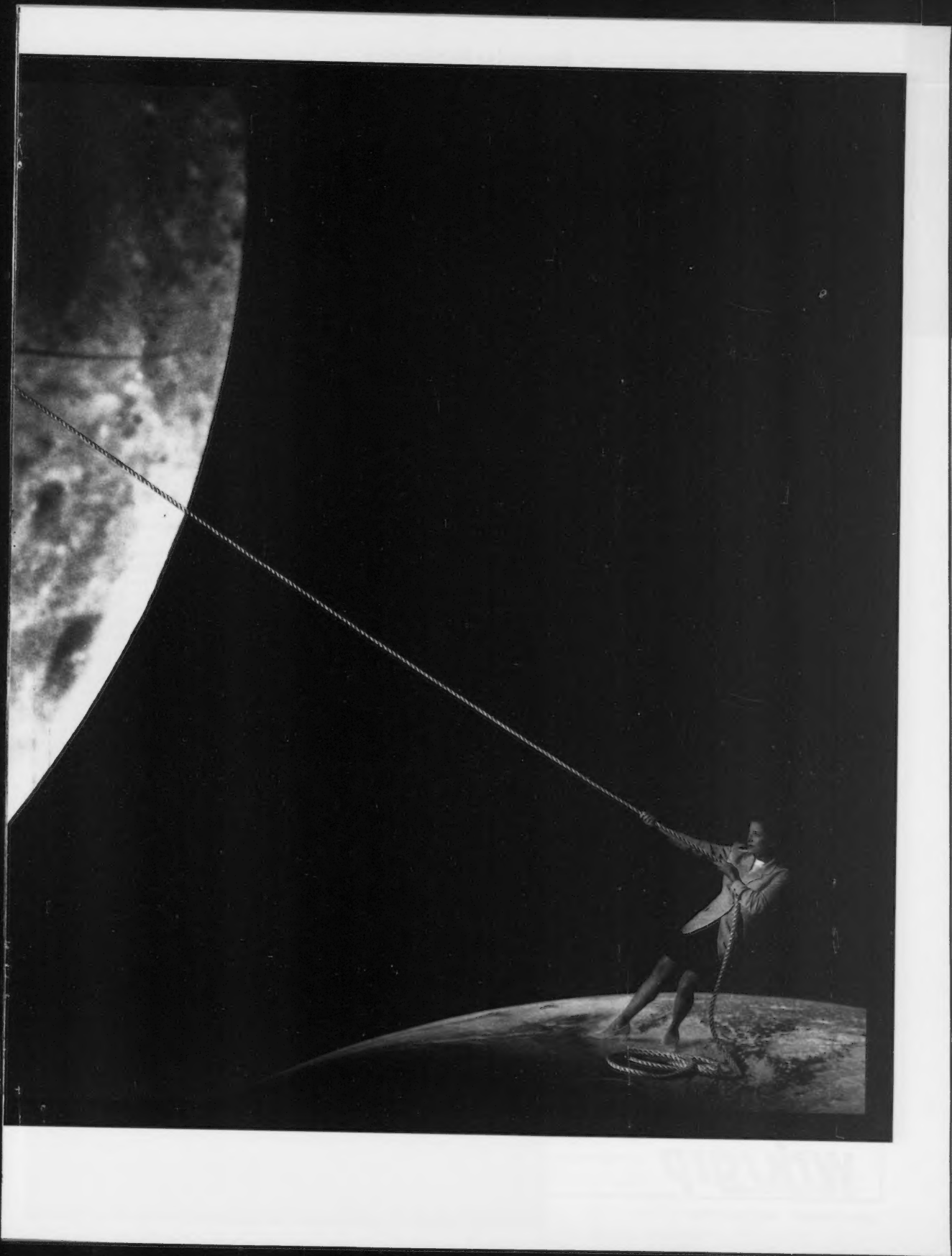


Computer Systems

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited.
HP-UX 9.0 and 10.0 for HP 9000 Series 700 and 800 Computers are X/Open Company UNIX 93 branded products. ©1999 Hewlett-Packard Company. GSV9501

For more information on our servers: 1-800-HP KNOWS or <http://www.hp.com/info/kc02>





Novell unwraps developer, marketing assistance

By Laura DiDio

With an eye toward helping developers bring NetWare 4.x applications to market more quickly, Novell, Inc. last week officially launched its Novell Directory Assistance (NDA) technical and marketing assistance program.

The program, which has been in a trial period for the past nine months, met with approval from end users.

NetWare applications

"Users like myself don't buy strategies; we buy products. I'm all for any initiative that will get good applications to market faster," said Glenn Madsen, senior network management engineer at Pacific Bell's LAN Management Center in Dublin, Calif. Pacific Bell has been using NetWare 4.1 since the beginning of the year.

The NDA program has two prongs: Novell-sponsored "developer kitchens" and cooperative marketing opportunities. Both are aimed at bringing a wide array of new applications that are "aware" of NetWare Directory Services (NDS) to market faster, by cutting down on the time it takes to build those applications.

The developer kitchens are a series of two-day technical events held monthly at Novell's corporate headquarters in Orem, Utah.

They are designed to give independent software vendors in-depth technical expertise and one-on-one assistance from Novell engineers working on NDS-aware applications, said Scott Wells, Novell's senior manager for independent software vendor marketing.

Novell charges \$250 for the first person in an organization to take the class. The price is discounted to \$150 for any additional people from the same firm who attend the course. The fee also entitles the company to priority developer support when they call Novell's technical support lines, Wells said.

Novell has also refined its software developers' tool kits for the NetWare 4.1 platform, adding more tools, application programming interfaces (API) and hooks into the source code to make the applications NDS-aware.

On the marketing side, Novell will work with its independent software vendor partners in joint advertising, direct mail campaigns, road shows and other marketing efforts.



Developers need apply

Since January, Novell has shipped more than 22,000 software developer kits for NetWare 4.1. The kits provide all the necessary tools, APIs and sample code needed to build NDS-aware applications.

Aspect brings telephony home

By Mindy Blodgett

The task of managing users in home-based or remote offices should get a little easier, thanks to a new call management software package that provides telephony capabilities to PCs.

Aspect WinSet for Windows, introduced last week by Aspect Telecommunications in San Jose, Calif., also makes it simpler and faster to distribute telephone calls from the main office to remote workers.

The software essentially consolidates computer and telephony functions onto the PC. Users can connect via standard phone lines, Integrated Services Digital Network (ISDN) or wide-area networks.

In addition, the product offers real-time information on workers and calls, allowing supervisors to more easily monitor performance.

A pledge to callers

Blue Cross/Blue Shield of Missouri in Kansas City, already uses Aspect WinSet, which is installed at its subsidiary, Trisource Health Care, Inc. The pediatric health center uses the software to ensure that all phone calls will be answered—even if the on-site operators are busy.

Using Aspect's Automatic Call Distributor feature, the system siphons calls to off-site operators using a frame-relay connection running over a wide-area network. This means calls get processed more quickly and patients don't get put on hold.

Elaine Willis, telecommunications manager at Blue Cross/Blue Shield, said the system has vastly improved patient service and makes it easy to track calls. Trisource can now link several health centers to its central call center using a single number for all calls.

Willis said the company is considering

installing the system for telemarketers and telecommuting insurance agents.

"With real estate so expensive, it just makes sense to have some people working remotely rather than setting up offices," Willis said.

Aspect WinSet is based on the Telephone Application Programming Interface standard, which is a specification embedding telephony control into software applications. It works with TCP/IP modes, so users are able to choose the connection method.

Features of Aspect WinSet for Windows

- Consolidates computer and telephony functions onto the PC
- Utilizes a Windows GUI
- Provides access to speed-dial lists and visual prompts when a call exceeds a specified length
- Gives users a single interface for functions such as viewing information such as call directories and communication with managers

The connection methods include the following:

- Using two standard analog telephone lines. One line supports a voice connection with Aspect's automatic call distributor and the user's analog telephone. The second line connects the TCP/IP network and the PC modem.
- Data and voice connections over ISDN.
- Linking an agent PC on a remote LAN to the office LAN via a WAN connection. A separate telephone line is also needed for the voice connection.

Aspect WinSet is available at a base price of \$2,700 per agent in a 16-agent configuration. Prices include the software, server, server software and a remote interface card.

MEDICAL ALERT...

Avoid Nervous Stress Disorder when Moving to Unix



Stop worrying about your programming productivity in Unix! Use the mainframe-style tools you've been using for years.

uni-XEDIT cms-style Editor with Full Macro Support

uni-REXX Portable System Control and Macro Language

uni-SPF ispf-style Editor, Browse, Utilities, even Dialog Mgmt!

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com

Moore

CONTINUED FROM PAGE 59

to a server, information accessed and the paths taken to that information. The software even indicates which direction visitors are headed after leaving the site.

The firm's Personal Web Site software is the first of what doubtless will be a new class of highly sophisticated, Web-oriented monitoring and marketing tools.

A tool such as this highlights the inherent conflict between marketing and privacy, which can be distilled into two questions that evoke the image of the irresistible force meeting the immovable object: "What do you have to hide?" vs. "Why do you want to know?"

Aggregate statistical information about how Web site visitors navigate servers is of legitimate interest to Web site designers and owners, of course. But trafficking in information about Web users' personal preferences or habits is an invasion of privacy.

Before long, most of the Web resources

you look at and the paths you navigate within them may be tracked and categorized. That information can then be sold to the highest-bidding direct marketer without your knowledge or consent.

The U.S. Postal Service routinely sells change-of-address information to the Direct Marketing Association without the permission of postal patrons. Direct marketers no doubt will compile and sell their own lists of E-mail addresses.

Web users may look for reassurance in home page pledges that say "Privacy assured. No surveillance of your browsing will be performed, and no information whatsoever about your use of this resource will be released to any third party for any reason."

But no matter how much privacy is promised, there won't be any way of telling whether anyone else knows how many times you ran that hilarious—but X-rated—cartoon animation you found on that server in Amsterdam.

Caveat browser.

Moore is *Computerworld's* senior editor, storage management.

Scalable Performance Only With Informix.

Nimble. Flexible. Responsive. All the things your systems have to be if you're going to stay ahead of the game when business requirements change. All achieved when you implement scalable systems—with a parallel, scalable database architecture as the cornerstone.

When it comes to demonstrating scalable performance—for OLTP, batch processing, decision support, or data warehouses of almost any size—Informix continues to be the database of choice.

In benchmark after benchmark, Informix proves its advantage. In fact, in TPC-C™ benchmarks on the leading UNIX® platforms, Informix is the database behind each hardware vendor's best overall performance.

And outside the labs, for customer after customer, Informix has proven its scalable performance by handling the most demanding requirements—including critical financial and banking applications, worldwide reservation systems, and manufacturing and business operations

for many of the world's largest corporations.

Let's face it. You can't afford a database that can't scale. If you're looking for the best, most extensive use of CPU power on uniprocessors, symmetric multiprocessors, clusters, or massively parallel processors, look to Informix. And let the facts speak for themselves.

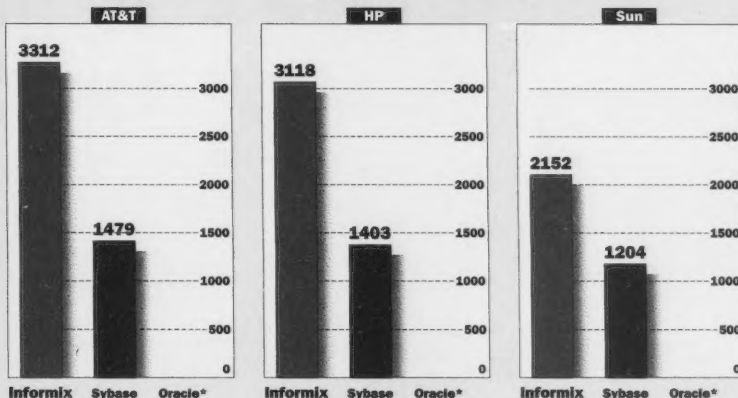
Call 1-800-688-IFMX, ext. 76 for a Seybold Group white paper on the quest for better scalability and performance.



Find us on the Web! <http://www.informix.com/>

© 1995 Informix Software, Inc. The following are worldwide trademarks of Informix Software, Inc. or its subsidiaries, registered in the United States of America and in numerous other countries worldwide: Informix®, the Informix logo®, and Dynamic Scalable Architecture™. All other names indicated by ® or ™ are registered trademarks or trademarks of their respective owners.

Scalable Performance in TPC-C Benchmarks (Transactions Per Minute)
Represents each hardware vendor's best overall TPC-C performance numbers to date



AT&T: Informix \$587/tpmC, available 3/31/95; Sybase \$718/tpmC, available 3/31/95. **HP:** Informix \$984/tpmC, available 3/31/95; Sybase \$758/tpmC, available 11/22/94. **Sun:** Informix \$863/tpmC, available 12/1/94; Sybase \$890/tpmC, available 1/29/95.
*Oracle has not submitted TPC-C performance numbers.

THREE GREAT REASONS TO

1

MIGRATING FROM ANALOG TO DIGITAL

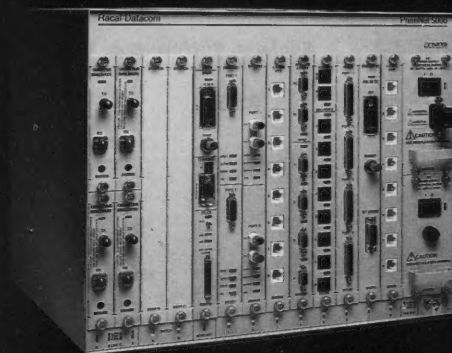


EXCALIBUR DAPs®

Excalibur Digital Access Products and DSUs come to you from the industry leader—Racal-Datcom. Whether your needs are fundamental business networking or high capacity mission-critical applications, Racal has a solution that works for you today, at your pace, and prepares you for the evolution to frame relay when you're ready.

2

TRANSPORTING DATA, VOICE, ATM AND VIDEO OVER FIBER



PREMNET®

Finally, a high speed solution for transporting multiple data, ATM, voice and video traffic safely and efficiently. With the PremNet fiber backbone from Racal, you can transparently send data in virtually any format at native speeds without the need to create separate networks for each application type.

Limited time offers expire December 31, 1995. Offers are subject to change without notification.

TRY THREE GREAT PRODUCTS.

3

BUILDING BANDWIDTH TO 1.544 Mbps ACROSS YOUR WAN



ISX 5300

The ISX 5300 is the digital access multiplexer of choice for building bandwidth across your wide area network. Designed to grow with your business, the ISX 5300 effortlessly supports migration to frame relay, fractional T-1, T-1 and ATM when you're ready.

4

REASON NUMBER FOUR

More than ever, your business depends on your network. For that reason, shouldn't you depend on a company that understands the importance of network communications? Since 1955 Racal-Datcom has helped the world's business and government organizations migrate mission-critical applications to new technologies and services. That's why all Racal products are supported by the company's strength in network management and expertise in managed migration services including network design, implementation, worldwide maintenance and support.

You can use any or all of these reasons to give us a call. Ask about our special promotions on Excalibur, PremNet and ISX 5300 products. For a limited time, we're offering *free network management software, free installation with your maintenance purchase, and free design services on select products.**

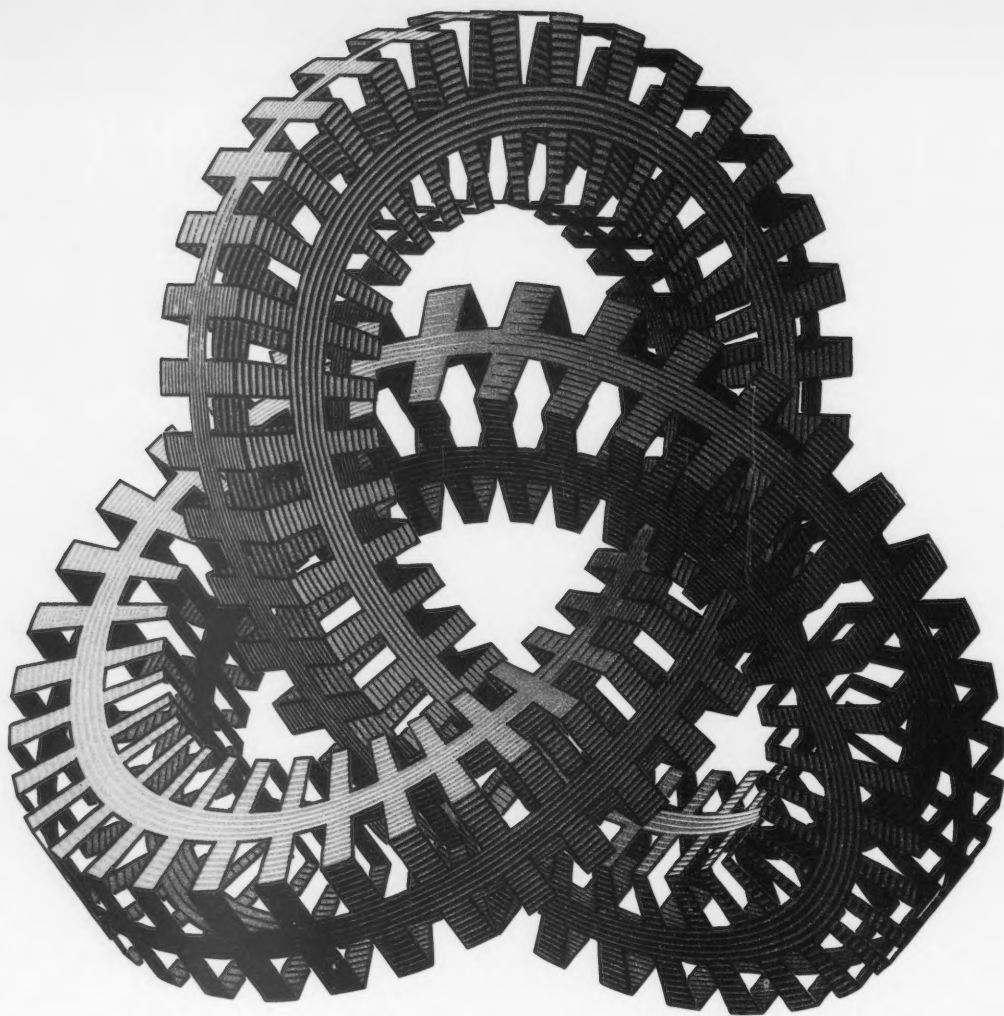
When it comes to managed migration, Racal has a solution. That's reason enough to call us today!

1-800-RACAL-55. Or visit us on the Internet at the Racal-Datcom Home Page, <http://www.racal.com>.

RACAL

Communicating through technology

Racal-Datcom is a registered trademark of Racal Electronics Plc. Excalibur and PremNet are registered trademarks of Racal-Datcom, Inc. © 1995 Racal-Datcom, Inc. All rights reserved.



BPCS Unix Client/Server. One solution to manage your supply chain.

There are winners and losers in all industries.

In the industrial sector, it's increasingly the ability to control the supply chain that makes the difference.

Complex industrial enterprises need the flexibility of a software system that can quickly and cost-effectively respond to the changing needs of customers.

A system that can truly integrate the supply chain through inbound and outbound logistics, customer service, logistics planning, materials management and warehouse management.

Giving you the power to take time and cost out of your supply chain.

That's why BPCS Client/Server is generated specifically for Unix, not ported. It's built on a proven scalable architecture that's unique to the industrial sector. And unlike some solutions, BPCS can enable fast, efficient implementation.

Because the faster BPCS Unix Client/Server is implemented, the sooner you'll increase your competitive edge.

The world's major corporations are using SSA products and global support in over 7000 sites in more than 70 countries.

Shouldn't we be talking?



ONE SOLUTION FOR THE TOTAL ENTERPRISE

SSA Inc. 500 West Madison, Chicago, Illinois 60661 USA. Telephone (312) 258 6000. Fax (312) 474 7500.

© 1995 M C Escher/Cordon Art - Baarn - Holland. All rights reserved. © 1995 System Software Associates, Inc. BPCS is a trademark of SSA. Unix is a trademark of Unix Systems Laboratories, Inc. Windows is a trademark of the Microsoft Corporation.

NEW PRODUCTS, 72
DG EXPLOITS NEW
ARCHITECTURE IN SERVER, 73

Large Systems

HARDWARE • SOFTWARE • CORPORATE STRATEGIES

IBM plans legacy bridges

MQSeries links allow access without code changes

By Craig Stedman
ORLANDO, FLA.

IBM is linking its newfangled MQSeries messaging middleware with mainframe-based IMS and CICS transaction processing applications. The move is aimed at making it easier for mainframe shops to close the gap separating their legacy and client/server systems.

To do this, IBM is building bridges, which company officials discussed at the Share, Inc. user group conference here this month. The bridges will let MQSeries customers give users on other systems access to IMS or CICS applications without having to change the mainframe code.

Today, MQSeries calls have to be built into a mainframe program before the application can work with the middleware. MQSeries allows pieces of distributed applications on different systems to communicate via asynchronous messages. The messages are stored in queues so processing can continue while a response is formulated.

Compared with the current level of ties

between MQSeries and the transaction environments, the promised bridges "will be like night and day. You won't have to touch your legacy code," said Anthony Slusz, a senior systems specialist at ITT Hartford Life Cos. in Hartford, Conn.

ITT Hartford uses IMS and CICS and is looking at MQSeries as a potential communications vehicle, "especially for some of our big applications that have partly moved off the mainframe" to smaller systems, Slusz said.

Client/server migration

Users on those systems need to get at the data left on the mainframe, and MQSeries — with direct bridges into IMS and CICS — would provide "a real cheap and easy opportunity to do that," he added.

However, it will be almost a year before IBM's bridging plan starts to become a reality — and even then, only IMS will be supported.

An IMS bridge is planned for the next release of MQSeries for MVS due in mid-1996, said Stuart Jones, a technical strategy planner at IBM's UK software laboratory in Hursley Park, England. The bridge will make data requests from non-mainframe users look like typical IMS inputs, he said.

The bridge to CICS will take longer to finish because that product is tied more closely to 3270 terminal mode than is IMS, according to Jones. Mainframe CICS applications are designed specifically for 3270 screen formats, whereas IMS uses a more message-like approach that is easier to adapt to MQSeries.

Building the bridge "requires changes in CICS as well as MQSeries," Jones said. "It's an obvious thing to do, but it's much more difficult." Shipment plans are uncertain because the project will have to be coordinated with IBM's ongoing development of CICS, he added.

As a result, the CICS plans amount to only "a good statement of direction" that holds the potential to simplify the task of connecting MQSeries to CICS applications, said Jerry St. Marie, manager of on-line systems solutions at Connecticut Mutual Life Insurance Co. in Hartford.

The bridge would provide "more flexibility on the legacy systems side," St.

The middle isn't holding
IBM is extending its MQSeries messaging middleware into the following areas

AREA	PRODUCT PLANS	SCHEDULED AVAILABILITY
NOTES	Bridge for connecting Notes to other systems	Unsupported early release shipping now; full version due third-quarter 1996
OBJECTS	C++ object binding support Ability to transport objects with IBM's DSO technology	Third-quarter 1996 Not specified
	Asynchronous object routing capabilities	Not specified
INTERNET	Routing of electronic payments	Not specified

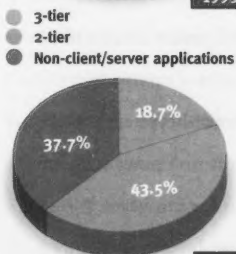
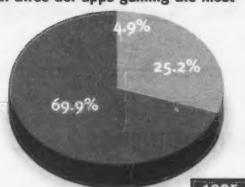
Marie said. But he noted it "has never come up in any of the conversations we've had with" IBM about MQSeries, which Connecticut Mutual has adopted as its communications infrastructure for distributed computing. IBM will have "to trick CICS somewhere" to make the bridge possible, he said.

Sally Cusack, an analyst at The Standish Group International, Inc. in Dennis, Mass., said an easier way "to have the old with the new" is important because MQSeries is being bought primarily by large corporate data processing environments that are heavy IMS and CICS users. "It still is very much a product that is used by the big shops" because of its complexity, she said.

The issue:

Data View

Use of client/server applications will continue to grow in the next two years, with three-tier apps gaining the most



*Projected
Base: 652 sites developing or implementing applications

Source: Strategic Focus, Milpitas, Calif.

Parallel processing wins film role

Digital production studio casts Convex to provide imaging infrastructure

By Michael Goldberg

Striving for the ability to render video special effects at warp speed, a new German film production center has tapped a Convex Computer Corp. parallel processing system as its entertainment engine.

The \$70 million High Tech Center Babelsberg, a government-funded digital film production studio in Potsdam, Germany, wants to be a global hub for real-time rendering of animated images. It will use high-end facilities that small "special effects boutiques" can't afford, said Peter Krieg, the center's director.

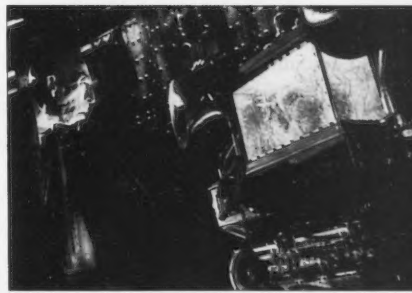
"We're going to be like a high-grade media Kinko's," he said.

Choosy about chips

Krieg said the High Tech Center, due to be up and running this fall, will use a 64-processor Convex Exemplar SPP 1000 system to provide the computing infrastructure needed for image scanning, motion control and three-dimensional virtual settings. The center plans to expand its Convex system next year to include 128 RISC 7100 processors from

Hewlett-Packard Co. when its new studios are built, Krieg said.

After a public bidding process, the German film center picked the Convex machine because of its commitment to the HP chips, Krieg said. He said studio officials also considered a system from Cray Research, Inc. but feared that its use of Digital Equipment Corp.'s Alpha chips made for an uncertain growth path.



A French special effects maker used Mental Images Software on an HP 9000 workstation to create 3-D images for The City of Lost Children, a film due out in November

Announced at the Siggraph show in Los Angeles Aug. 7, the win by Richardson, Texas-based Convex shows that the entertainment industry's demands for processing power have reached levels traditionally dominated by scientists and engineers. It also ratifies Convex's recent moves to embrace a more open, scalable parallel architecture, said analyst Gary Smaby at The Smaby Group in Minneapolis.

The High Tech Center will use rendering software called Mental Ray by Mental Images Software in Berlin, Germany. Softimage, Inc., a Microsoft Corp. subsidiary, includes Mental Ray in its 3D Extreme animation package. The package has been used to produce special effects in Hollywood movies such as *The Mask and Casper*, according to a Film, page 73

Keep *your* Windows 95 software *in* one *of our* beautiful, custom -

DIGITAL INTRODUCES A FULL LINE OF COMPUTERS OPTIMIZED FOR WINDOWS® 95.

Yes, our PCs and notebooks are beautiful. But perhaps phenomenal is a better way to describe some of

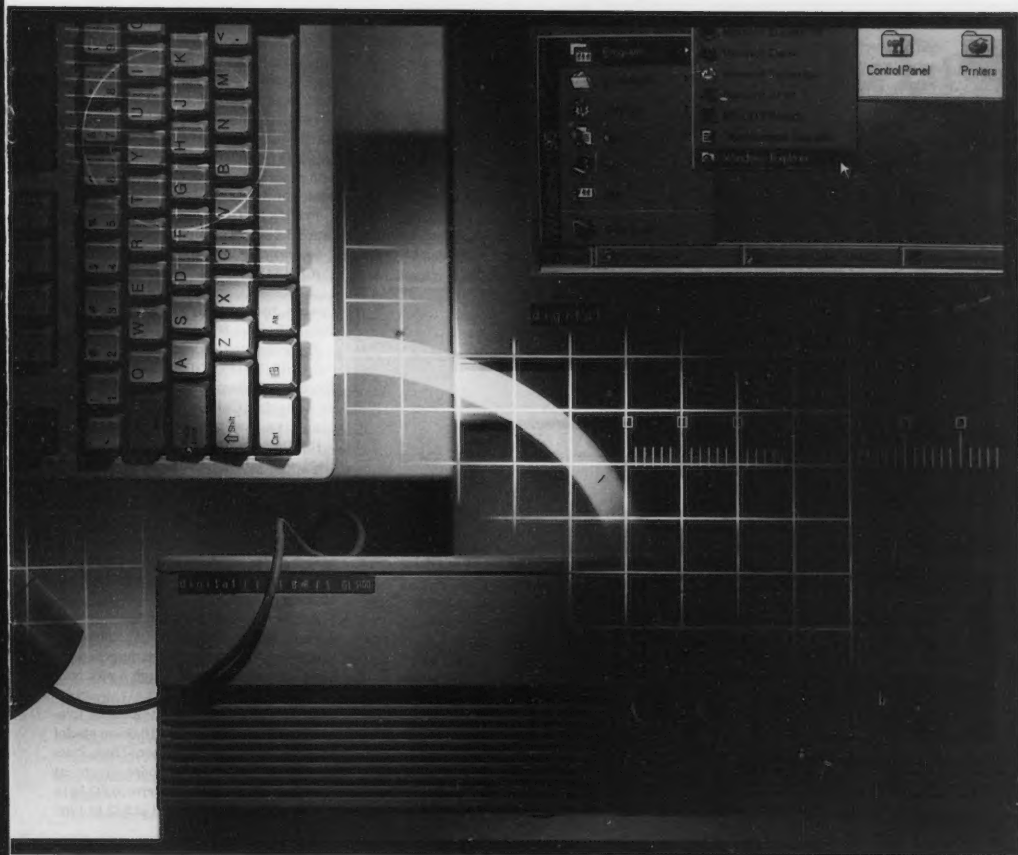


the industry's most robust platforms for Windows® 95. Take the new Celebris™ GL.

For the advanced productivity business user, it sports EDO memory, pipeline burst cache and PCI bus master E-IDE. Network-ready with integrated Ethernet and DMI, it also has integrated 3D, 64-bit graphics with WRAM,

audio and CD ROM. And Windows® 95 makes all of these powerful features easy to use.

The alliance between Digital and Microsoft isn't new; it's been going strong for ten years. Now, with 450 field locations world-



- designed cases.

wide, and over 5,000 Microsoft-trained professionals, Digital is a key Microsoft Authorized Support Center and the only major PC vendor to be a Windows® 95 Outsource Partner. You can make a case for the benefits of such an alliance. We've made several.

Call 1-800-DIGITAL for your nearest reseller or visit our Web Site at www.pc.digital.com.

Designed for

Microsoft
Windows 95

digital
PC

ALLIANCE FOR ENTERPRISE COMPUTING

Large Systems

New Products

IBM has announced Visualization Data Explorer 3.1, a tool for data visualization and analysis.

According to IBM's Research Division in Yorktown Heights, N.Y., Visualization Data Explorer 3.1 lets users take data generated by models, simulations, experiments and commercial applications

and convert it into two- or three-dimensional images.

Data Explorer 3.1 supports a wide range of Unix platforms, including parallel performance on symmetric multiprocessors (SMP) models from IBM, Sun Microsystems, Inc. and Silicon Graphics, Inc. (SGI). It is available on IBM's RISC System/6000, RS/6000 SP2 and selected models from SGI, Digital Equipment Corp., Hewlett-Packard Co., Sun and Data General Corp.

Pricing for uniprocessor node locked licenses starts at \$5,900. Pricing for the SMP version starts at \$9,400.

► IBM
(914) 945-3982

Andyne Computing Ltd. has rolled out GQL Decision Support System 3.3.2, an ad hoc query and reporting tool for relational data sources.

According to the Kingston, Ontario, company, GQL Decision Support System

3.3.2 lets nontechnical users query and report on information in relational databases. GQL Decision Support System 3.3.2 includes a feature that automatically resolves interdependent calculations, a time-based governor that protects database systems from overly long queries and a scripting facility that helps automate routine tasks.

Pricing for GQL Decision Support System 3.3.2 starts at \$495 per user copy.

► Andyne Computing
(613) 548-4355

Cranel, Inc. has introduced RAIDworks 1000, a RAID subsystem.

According to the Columbus, Ohio, company, RAIDworks 1000 provides 3G to 20G bytes of magnetic storage. It appears as a single SCSI disk drive to the host computer.

RAIDworks 1000 uses integrated drive electronics (IDE) drive technology, which eliminates the setup time of SCSI-based RAID systems. It features a RAID striping algorithm that is designed into an integrated circuit chip for the RAID controller. The system also includes a battery-backed cache buffer and a load-sharing power supply.

RAIDworks 1000 has a cable-free disk drive design, with the IDE drives in frame-based carriers that connect to the hardware controller through a slot connector.

RAIDworks 1000 is available in five- and 10-drive models. The 10-drive model is available only as an external box. Pricing for the five-drive model starts at \$5,616. Pricing for the 10-drive, 6.8G-byte model starts at \$8,274 and at \$12,614 for the 13G-byte model.

► Cranel
(614) 431-8000

NetSoft has introduced the NS/Elite Folders Bundle, a product for IBM AS/400 connectivity.

According to the Irvine, Calif., company, the NS/Elite Folders Bundle is a Microsoft Corp. Windows 3.1-based communications software package. It combines 5250 display and printer emulation, file transfer and native Windows access to the AS/400 Shared Folders facility.

The product offers multisession display, an icon tool bar with scalable fonts and color attributes, SQL-based data download and data transfer upload. It incorporates the NetSoft/Router, a router for Windows-to-AS/400 connectivity.

The single-user price of NS/Elite Folders Bundle is \$295. AS/400 processor-based licenses are also available.

► NetSoft
(714) 753-0800

Product short

Lysis Corp. has introduced IBM AS/400 server support to its Shared Information System 2100, artificial intelligence software used for technical support hot lines. It now provides a native AS/400 customer service application that uses three-tiered client/server processing and graphical user interfaces. Cost: starts at \$35,000 for a 10-user license. Lysis, Atlanta, Ga. (404) 892-3301.

In 1995, the average
IS Organization will
spend 48%* of their
budget on staff.

The best in IS will
be spending 31%.

Where do you stand?

Are you facing shifting budget priorities? Do you know if you're spending your money on the right issues? These days, you're faced with countless questions regarding your IT needs. Fortunately, there's one company uniquely positioned to provide you the answers: Infovision International.

Infovision International can provide your company with customized decision support and advisory services that are supported by the following key features: Planning templates. Direct access to senior analysts. Extensive electronic knowledge base. Ten year forecast horizons. Comprehensive ROI-based solutions.

Of course, we can't expect you to appreciate the value of Infovision International from this ad. That's why we're offering free 30-day access to the Infovision International knowledge base through our bulletin board system. For a free trial, call 1-800-321-9933 ext 200. And start getting some answers to your IT questions.

Infovision International

AN INTERNATIONAL DATA GROUP COMPANY

1-800-321-9933 ext 200

*Based on IDC and Computer Economics estimates.

Unix alters IS picture for Kodak Malaysia

By Jini Wong
KUALA LUMPUR, MALAYSIA

In retrospect, Eastman Kodak Co.'s decision to go with Unix as its worldwide standard was perhaps the easiest part of the company's migration to open systems. Because here in Malaysia at least, getting there from the company's crop of proprietary systems was no trivial matter.

Toward the end of last year, it became clear to Kodak's information systems groups around the world that their IBM System 36s could not sustain the company's projected business growth, so Kodak elected to standardize on IBM's Unix-based RS/6000.

"From that moment of deciding on the RISC machine, our next objective was to move our applications, originally based on the development tool RPG, onto the new platform," said Rosmawar Mohd Yusof, IS manager at Kodak Malaysia.

To move all the applications, Yusof needed to find a means of running the RPG-based applications on Unix. Her team evaluated two interface translators and settled on Unibal.

For the following five months, "all we did was customize all our applications to run on the RS/6000," Yusof said. "The migration is totally transparent to users, as they still see the same screen and mostly use the same commands as before."

Problems abounded during the switch. First,

the team faced complications in terms of licensing. Next, some programs corrupted in translation, and someone had to be assigned to hand-carry those programs from Kodak's Asia Pacific headquarters in Japan, Yusof said.

The upside

Yusof said other Kodak IS staffers in the Asia Pacific region are working with vendors such as Oracle Corp. to develop new financial and logistics systems for the RS/6000. "These packages are to provide us with better, interactive, real-time applications," she said.

The company's selection of the RS/6000 on a worldwide basis has also given rise to abundant opportunities to streamline operations.

For starters, the IS team at the corporate level has designed the Kodak Network, which allows Malaysia IS staffers to sign on to any of Kodak's RS/6000 machines in the region. As a result, the Malaysia IS team can tap into, say, the Australia information technology group to ask for its Unix expertise.

The company has also installed a leased line. "File transfer is very much improved," Yusof said. "Previously, when we needed to send a file down to our Singapore office, we would have to have the file copied onto a diskette and then dispatched by courier. Now, however, we just have to dial up to Singapore and have it sent within minutes."

Wong writes for *Computerworld Malaysia*.

Data General server exploits new architecture

Technology trades speed for bandwidth

By Neal Weinberg

In its new high-end server, Data General Corp. is using an emerging architecture called NUMA, or Non-Uniform Memory Access, to break through barriers that have limited the scalability of symmetrical multiprocessing (SMP) machines.

DG last week introduced its Avilion AV 10000, a machine based on the NUMA architecture that scales to 32 processors.

Analysts say NUMA could gain in popularity as vendors try to boost server performance without

cessor board, easing bus traffic.

NUMA creates a distinction between "near memory access" and "far memory access," such that data that resides farther away from the processor is retrieved more slowly.

By trading off on response time, NUMA gains "more bandwidth on the bus," said Jay Bretzmann,

an analyst at International Data Corp. in Framingham, Mass.

Bretzmann said universities have experimented with NUMA, but the architecture has not yet broken through to commercial computing.

He predicted that once the industry moves toward commodity multichip motherboards, "then you'll see more NUMA systems come out," Bretzmann said DG is putting itself "at the forefront" of that trend.

Speed demon

The Avilion AV 10000 Server features the following:	
Number of processors:	32
Memory capacity:	16 GB
Backplane:	1G byte/sec.
DBMS capabilities:	DBMS independent
Availability:	End of 1995
Price:	Under \$5 million

having to take the leap to massively parallel processing systems, which would require an entire software conversion.

"Everyone is faced with the issue of how to coordinate more processors to tackle big jobs," such as data warehousing or data mining, said Jonathan Eunice, an analyst at Illuminata in Nashua, N.H.

"Everyone can do four to eight processors; most can do 12 to 16," he said. "Thereafter, it gets harder and harder."

That is because under the standard SMP configuration of Uniform Memory Access (UMA), all processors are required to provide equal access to data stored in memory.

In other words, "every time a CPU needs data, no matter what CPU or where the data is, it takes the same amount of time to get it," Eunice said.

But as the number of processors increase, there is so much traffic over the buses that bottlenecks occur and performance suffers.

What NUMA does is integrate a portion of memory onto the pro-

Around the bend

In the first quarter of 1996, DG is expected to come out with what Eunice calls a "commodity supercomputer," an SMP machine based on Intel Corp.'s P6 chip packaged into multiprocessor motherboards using the NUMA architecture.

Ray Duchscherer, managing director of Sabre Travel Information Network in Fort Worth, Texas, uses DG's 16-processor servers in the reservation systems he designs for travel agencies.

Duchscherer said he is looking forward to the 32-processor machines for their capability and power. "When I get a really big customer, it's going to come in really handy," he said.

However, not all users need that much firepower. Kevin Reilly, information systems administrator at Richardson Electronics, Inc. in LaFox, Ill., has two Avilion 9500 machines, each with four processors. He said he has plenty of upgrade room on the 9500 before he has to "change chassis."

Short time

The Avilion 10000 is based on the Motorola 88100 chip, which Data General is phasing out in favor of Intel's P6.

Briefs

Mmm, mmm, outsourcing!

Campbell Soup Co. in Camden, N.J., has signed an outsourcing contract that it hopes will save it \$180 million over 10 years. The contract gives responsibility for a large chunk of Campbell's mainframe, midrange and desktop systems to IBM's Integrated Systems Solutions Corp. (ISSC). Campbell's internal information systems group will concentrate on developing strategic

business applications, while ISSC will handle mainframe, midrange and desktop systems. Meanwhile, National Steel Corp. signed a seven-year deal with SHL Systemhouse, Inc., which will assume operational responsibility for the Mishawaka, Ind.-based steel company's IS operations.

IBM, SAP to join in support

IBM and SAP AG have signed a worldwide cooperative support agreement to provide 24-hour service and support to companies integrating SAP R/3 client/server applications on IBM RS/6000 machines.

Film

CONTINUED FROM PAGE 69

All in one

The High Tech Center Babelsberg, located on the site of Europe's oldest film studio, plans to offer digital image scanning and recording facilities, real-time motion control of images and virtual set stages.

Softimage spokesman.

Krieg said the High Tech Center would use high-speed Asynchronous Transfer Mode technology to transmit video and sound images to clients at remote sites. The center, which won't produce its own works, expects most

of its early clients to come from North America. Its first slated project this fall is rendering the 3-D backdrops for *Dark Zone*, a four-part science fiction series for German and Canadian television.

While Krieg said the High Tech Center expects the Warner Bros. studios to be a client, other smaller special effects makers said they were impressed with the Convex processing power but skeptical of the German-based model. They expressed concern over the cost of remote transmissions, the compatibility of their imaging software with the High Tech Center's and a loss of control over production.

"It's not just the computing power; it's getting the massive amounts of data there and back," said Bob Curley, a computer scientist at Rhythm & Hues Studios in Los Angeles.

CLIENT? SERVER?

HOW DO I CHOOSE THE RIGHT TOOL?

Axiant[™]
ANSWERS IT.

© 1995, Cognos Incorporated. Axiant, Cognos and Tools That Build Business are trademarks of Cognos Corporation.

Choosing the right client/server development tool is a big decision. So take some advice from industry analysts like Judith Hurwitz of Hurwitz Consulting Group and Ed Acly of IDC: Consider the applications you intend to build. Then select a tool to grow with your needs.

We've got the answers to help you pick.

In a new Cognos report, *The Right Tool for the Job*, the experts agree: Whatever you're building, match the tool to the task. It's decision support now. But it might be quickly scaled-up to a comprehensive transaction-intensive business application soon. So prepare yourself with the tool that builds and supports both.

Choose the tool that gives you choices.

Axiant[®] is the analysts' answer – it gives you the best of both worlds. It's a graphical application development solution with a robust 4GL engine and built-in decision support tools. Axiant applications deliver the Windows-based interface you need and the self-service

decision support users demand. Plus support for transaction-intensive applications you can deploy on client or server.

Get The Right Tool Kit. Right now.

For more answers, call for your free Right Tool Kit. It includes *The Right Tool for the Job*, featuring insight from Hurwitz, Acly and others. Along with an Axiant White Paper, the Cognos interactive CD-ROM, and full products details. Call today. See how choosing the right client/server tool starts with asking questions. And ends with the tool that gives you answers.

1-800-365-3968, EXT. 2075

GET THE RIGHT TOOL KIT. CALL NOW!

COGNOS[®]
TOOLS THAT BUILD BUSINESS[™]

Application Development

75

Application Development

CASE • LANGUAGES • TOOLS

Visual Basic shifts focus

Improved, added enterprise features challenge Delphi

By Christopher Lindquist

By now you've no doubt heard the talk about how much faster Borland International, Inc.'s Delphi is than Microsoft Corp.'s Visual Basic 3.0. Perhaps you've even discovered this truth for yourself. Then along comes Visual Basic 4.0 Enter-

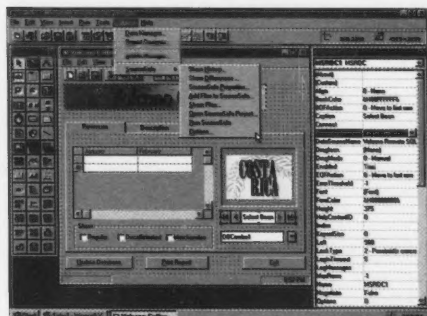
prise Edition, which may prove that the product that compiles and runs fastest still may not win the corporate race.

Little has changed on the surface, and that benefits those thousands of developers already familiar

with the product. The most obvious improvement — and advantage — to Visual Basic 4.0 Enterprise Edition is that it supports 32-bit environments, including Microsoft's Windows NT 3.5 and Windows 95.

Visual Basic 4.0 now includes support for Windows 95 controls, such as Image List, Status Bar and Plug & Play Control. Delphi does not have such support nor will it until Borland's next release due this fall. Visual Basic 4.0 also includes support for creating 16-bit applications for use under Windows 3.1, which provides a migration path for users who

Visual Basic, page 77



Visual Basic 4.0 Enterprise Edition now supports 32-bit environments, including Windows NT 3.5 and Windows 95



Next's WebObjects

Next Computer will reveal pricing for a new suite of World Wide Web development tools when the products ship in the first quarter of 1996

- WebObjects adds a Hypertext Markup Language presentation layer atop object-oriented applications.
- World Wide Web users can also access non-object data, such as information stored in relational databases, via WebObjects' interface with Next's year-old Enterprise Objects Framework.
- Programs built with WebObjects can talk to OLE objects through Next's Distributed OLE for Windows.

Next? Object tools for Web

WebObjects taps into corporate database

By Kim S. Nash

If anyone can evangelize object-oriented development for cyberspace, it's Steve Jobs.

Jobs, chief executive officer at Next Computer, Inc., recently announced WebObjects, a tool set for building applications for the World Wide Web. The object-oriented tool cuts application development time by five to 10 times compared with existing client/server tools, Jobs claimed.

This has not been proved, however, as WebObjects has yet to enter beta testing at any information systems shops. Testing is slated to start immediately, Jobs said, with general availability scheduled for the first quarter of next year.

Multiple on-ramps

With WebObjects, users can build applications that, for example, add a Web-readable Hypertext Markup Language layer on top of corporate data or applications.

That means end users can access legacy data or in-use applications via browsers from Netscape Communications Corp., Spyglass, Inc. or others, said John Landwhere, a product manager at Next in Redwood City, Calif.

Web users wouldn't have to rely on separate, manual updates of information at Web sites, not

ed Richard Shaffer, editor of "ComputerLetter," a New York-based newsletter.

That capability in WebObjects and similar tools due from ParPlace-Digital, Inc. "is a conceptual leap," Shaffer said.

For security, WebObjects also supports the Secure Sockets Layer and Secure Hypertext Transport Protocol.

Next outlined other key capabilities of WebObjects at the show (see chart).

"If what they say is true, and I have no reason to doubt it, this is a killer set of tools," said Mike Adelson, director of application development at Chrysler Financial Corp. in Littleton, Ill.

Far-out features

High on Adelson's list of "really cool" WebObject features is the ability for developers to build Web applications that can access corporate data stored in relational databases, he said. He saw an early version of WebObjects demonstrated two weeks ago at the Object World conference in San Francisco (see story at left).

Yet Next is not alone — not by a long shot. Oracle Corp. in Redwood Shores, Calif., also plans to ship a suite of Web development tools in the same time frame: first-quarter 1996. Mountain View, Calif.-based Netscape also plans to launch development products next year.

C++ standard binds rivals

By Elizabeth Heichler
SAN FRANCISCO

A recently finalized standard for C++ may bolster developers' confidence in the object-oriented programming language.

Rival firms, including Borland International, Inc., Symantec Corp. and Hewlett-Packard Co., are already rallying around the draft standard, with promises to release compatible products by early next year. The companies would not release details about those products.

Developers cheer

Developers agreed that a standard for C++ — the dominant object-oriented programming language, according to International Data Corp. — will protect their investment in applications developed with the language.

"From a personal point of view, it's good to know that your skills will be portable. And from a professional point of view, it's good to know that code you develop is portable to different en-

vironments," said Rick Leir, software designer at Atlantis Scientific Systems, Inc. in Ottawa. Leir said he plans to use C++ to develop image processing systems and has decided to work with the language in part because of the standardization effort's progress.

The draft C++ standard, a joint effort of the American National Standards Institute and the International Standards Organization, is now frozen and available for public review. It will be formally published later next year.

A standard for C++ helps to address some of the reasons that developers have chosen not to work with the language, particularly the incompatibility of different vendors' C++ implementations, according to

observers. An extension of this problem has been that C++ class libraries — pre-existing building blocks of code — often don't work with all C++ development environments.

Another myth C++ backers hope to dispel is that the language is too complex for most corporate developers to tackle, said Bjarne Stroustrup, AT&T Bell Laboratories fellow and the original developer of the extensions to the C language that evolved into C++.

Developers can choose to use C++ for the less complex task of assembling software components or to tackle the more difficult work of actually building the components themselves, he explained.

C++ has been criticized for not forcing developers to write strictly object-oriented code. Smalltalk does enforce this.

Two in one

Rogue Wave Software, Inc.'s President and Chief Executive Officer Tom Keffer proposes that C++ be viewed as two language environments in one. "Bottom C++" is the more complicated language, for building objects, while "Top C++" is a relatively simple tool for manipulating already assembled objects.

Object tools

Object tools for Win 95 emerge

By Elizabeth Heichler
SAN FRANCISCO

The first Windows 95 object-oriented development packages were on view at Object World, held here two weeks ago.

In some cases, the Windows 95 products represent the object-oriented tool makers' first forays into the desktop PC environment. They include Cadre Technologies, Inc.'s ObjectTeam for OMT and Micro Focus, Inc.'s Visual Object Cobol 1.0 for Windows 95.

But what sets these tools, as well as Franz, Inc.'s Allegro CL 3.0 for Windows, apart from their predecessors is that they take advantage of the new operating system to deliver a more visual development environment, observers said.

An early user of Visual Object Cobol 1.0 for Windows 95 praised the extent to which it integrates tool features with the full look and feel of the operating system.

For example, the object browser is fully integrated into the development environment, said Steve Rabin, chief technologist at American Software, Inc. in Edgartown, Mass. "It's also got very good support for multithreading and OLE automation," Rabin added, making it easier to develop applications that take advantage of these Windows 95 features.

Users of the Cobol tool from Palo Alto, Calif.-based Micro Focus said they are pleased with the native Win32 class library for graphical user interface objects, which is needed to build user interfaces that conform to Windows 95.

Cadre, in Providence, R.I., has also built "a nice object browser" into the Windows 95 user interface with its Object Team for OMT tool, according to a customer who requested anonymity. Users can access the entire development repository and browse it in many ways.

The Cadre product is the company's

first release of a development environment implementing the Object Modeling Technique (OMT) methodology, which it acquired when it bought Dutch software firm Westmount Technologies Corp. earlier this year. OMT is the most popular object-oriented methodology, with 32% of the market, according to Gartner Group, Inc. in Stamford, Conn.

Cadre's product can generate code in C++, Ada, Smalltalk, embedded SQL and the fourth-generation language used by Informix Software, Inc.'s NewEra tool. Cadre is also working on extending the code generation to PowerScript, used in Powersoft Corp.'s PowerBuilder.

Meanwhile, Franz, in Berkeley, Calif., showed off its visual development tool for Windows 95, Allegro CL 3.0 for Windows.

Because it is based on the ANSI-standard Common Lisp Object System, it is the first dynamic object-oriented programming tool for Windows 95, Franz

maintains. Dynamic languages allow developers to make changes to an application after it has been deployed without accessing the source code.

Around the corner

New Windows 95
object-oriented
development tools

Object
ORIENTED

► Micro Focus, Inc.

Palo Alto, Calif.
Visual Object Cobol 1.0 for Windows 95
\$499, shipping Oct. 1

► Franz, Inc.

Berkeley, Calif.
Allegro CL 3.0 for Windows
\$995, shipping in October

► Cadre Technologies, Inc.

Providence, R.I.
Object Team for OMT
\$5,000, shipping at the end of September

Briefs

Macs to get Windows sockets

NetManage, Inc. has announced plans to enable the Macintosh operating system to support WinSock 1.1, the Windows Socket application programming interface (API) to TCP/IP network services. The San Jose, Calif., developer plans to extend the architecture of Apple Computer, Inc.'s Open Transport networking and communications sys-

tem to allow for cross-platform programming among Mac OS and Microsoft Corp.'s Windows, Windows NT and Windows 95. As a result, Windows software developers could easily develop TCP/IP networking applications for Mac OS, and corporate developers could gain a portable network API across both platforms, according to NetManage.

Warehouse helper arrives

Software AG of North America, Inc. in Reston, Va., recently announced

SourcePoint, software that automates the process of populating data warehouses. Based on parallel data acquisition technology, SourcePoint simultaneously extracts, transports and loads data into a warehouse, a process that has been largely manual up until now, the company said. Pricing ranges from \$30,000 to \$129,000, depending on communications options.

Book it: Mainstream objects

Software development guru Ed Yourdon has co-authored a book from Pren-

tice-Hall. The book, *Mainstream Objects: An Analysis and Design Approach for Business*, was written with developers from Reston, Va.-based Software AG. It aims to define a new approach to solving business needs through object systems development. The book presents Software AG's framework for incorporating object-oriented techniques into design and analysis. It is 331 pages and costs \$35. Prentice-Hall can be reached at (800) 947-7700 or via electronic mail at orders@prehall.com.

In business, slow is not an option. If you're looking for...

- EIS/Data Warehousing
- Rapid Application Development
- Client/Server Applications

Speedware Corporation is an international organization with thousands of satisfied customers and products with a proven track record.

New Products

Texas Instruments, Inc. has introduced Arranger, a suite of development tools.

According to the Plano, Texas, company, Arranger lets users rapidly assemble and reuse business objects. It gives users immediate access to enterprise applications and data through OLE-based desktop applications.

Arranger is available in Standard and Professional editions. The Standard edition gives users tools to customize applications. It includes the Arranger Catalog, which maintains an inventory of business objects made available to the desktop user. The Professional edition

was designed for information systems developers to enroll business objects into the Arranger Catalog.

Pricing is based on the number of developer and user seats. Pricing starts at \$495 for the Standard edition and \$2,495 for the Professional edition.

► **Texas Instruments**
(214) 575-2000

Segue Software, Inc. has introduced QA Partner 3.0, a software testing tool.

According to the Newton, Mass., company, QA Partner 3.0 is a broad, integrated multiplatform testing product for QA users. It provides automated testing in an object-oriented architecture that can reuse the same test script across multiple platforms.

QA Partner 3.0 includes an Automated

Testframe Creation feature for unattended testing and recovery. This enables the creation of small modular test cases, each with the capability to be independent of the other. When an application being tested crashes, the recovery system records the error, restarts the test and continues.

Integrated test analysis and reporting features are available.

Pricing for single-user, single-platform licenses starts at \$2,995.

► **Segue Software**
(617) 969-3771

System Software Associates, Inc. has introduced Object Development Workbench, a set of application development products.

According to the Chicago company, Ob-

ject Development Workbench consists of the following: Object Definition Facility (ODF), a specification layer in which all business objects are defined; Object Repository, a repository for the business objects; Gen/C++ for Windows, a generation layer that generates platform-specific code from the objects repository; and a deployment layer.

Based on the business objects stored in Object Repository, Gen/C++ for Windows generates executable object-oriented code for a Microsoft Corp. Windows 3.1 or Windows 95 environment.

Each of the three component products — ODF, Object Repository and Gen/C++ for Windows — is priced at \$2,500 per user.

► **System Software Associates**
(312) 258-6000

Visual Basic

CONTINUED FROM PAGE 75

might not be running Microsoft's latest and greatest yet.

However, the ability to run under Microsoft's newest operating system may pale when compared with the host of enterprise development features found in Visual Basic 4.0. Microsoft has apparently paid close attention to the concerns of corporate developers who need to build and manage scalable, enterprisewide applications. While products such as Visual Basic 3.0 and Delphi contain everything a developer might need for small projects, things could quickly spiral out of control as the number of users and developers grows.

Microsoft has addressed this scalability challenge in several ways, including

a three-tiered development model, an integrated version control and configuration management system and the opening of Visual Basic as an OLE object that can be controlled by other applications such as computer-aided software engineering (CASE) tools.

Microsoft's three-tiered development model was designed to alleviate the bottlenecks some developers have encountered with Visual Basic when building client/server applications for a large number of users.

Middleman

In the model, applications are divided into User Services, Business Services and Data Services. In effect, nothing has changed from the traditional client/server model except for the intro-

duction of a middleman, the Business Services layer. This layer was designed to manage user requests for data and buffer those users from having to directly access the main server.

Product highlights

- Fully 32 bit, with support for 16- and 32-bit deployment.
- Can create OLE automation servers, distribute applications logic to NT servers.
- Ships Sept. 12

The User Services portion of the application becomes an interface to the Business Services layer. So when business rules change, only the Business Services portion of the application needs to be updated, rather than hundreds or possibly thousands of individual client workstations. Of course, this requires that the developers actually adhere to Microsoft's model to achieve the benefits.

Visual Basic 4.0 Enterprise Edition also comes complete with Microsoft's SourceSafe version control and configu-

ration management system. This goes a step beyond Borland's Delphi by actually including the tools necessary to manage code used by multiple developers for multiple projects.

The opening of Visual Basic as an OLE object gives Microsoft a chance to compel third-party developers, such as CASE tool makers, to use Visual Basic. One common use for this openness may be for developers to create their own versions of Microsoft's "Wizards" to help other developers create applications according to corporate standards.

Finally, it just wouldn't be a Microsoft product if it didn't include all the extras at a price lower than the competition: \$999 compared with \$1,999 for Delphi's Client Server edition.

Lindquist is technical editor at *Electronic Entertainment* and a regular contributor to *Computerworld's Client/Server Journal*.

Call us for the speed you need. 1-800-276-9950

SPEEDWARE

BECAUSE SLOW IS DEAD

Visit us on the World Wide Web at: <http://www.speedware.com> e-mail: moreinfo@speedware.com

Five Ways

My Company Can Help Your Company Make Better Business Decisions

The best way to improve decision making is to start with good information.

Complete. Accurate. Current. And available to everyone who needs it—when they need it.

Turning corporate data into real business information, and delivering it to the right people at the right time, is our business.

We've been doing it for almost 20 years for many of the world's most successful companies. And we can do it for you. Here's how:



Dr. James H. Goodnight
President, SAS Institute Inc.

Data Warehousing There's no better way to stage the data used in decision making. Put it where people can get to it without a lot of nonsense—and away from your on-line transaction processing systems. Your decision makers will get consistent and up-to-date data they can use—without dragging down the performance of your operational systems. Whether you need a complete end-to-end solution for data warehousing, a piece here or there, or just some good advice, we can help.

2

Business Intelligence You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

3

Technical and Analytical Tools Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

4

Applications Development If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.

5

Business Solutions Maybe you're not ready to tackle that system alone. You won't have to. Our professional services staff can help you as much (or as little) as you require. We can train you, sit beside you, or build complete decision-based applications to your specific requirements.

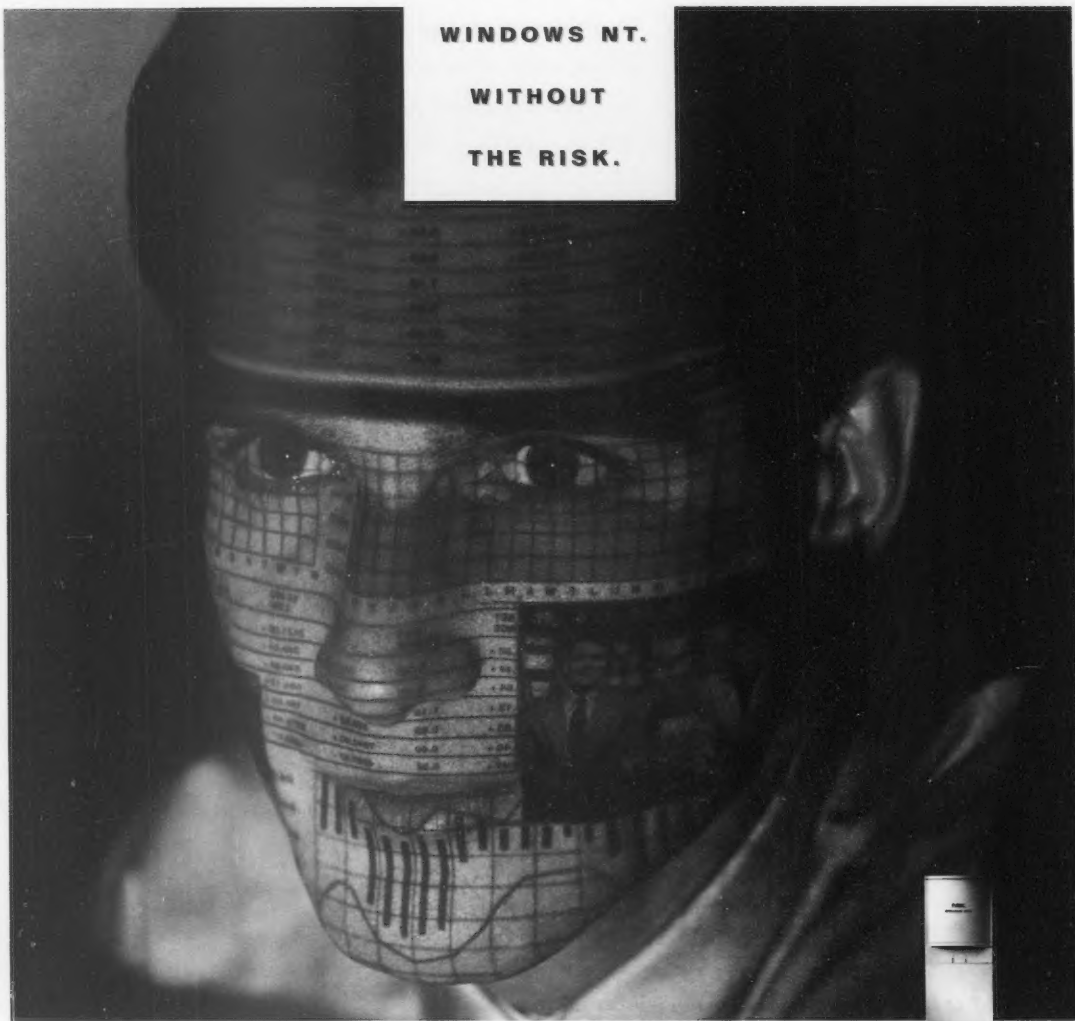
The Bottom Line Better decision making can give you the competitive advantage you've been looking for. And if you're a Fortune 500 company, there's an excellent chance we're already at work helping you. To find out the role our technology and services can play in your organization, and to receive our free guide, give us a call or send us E-mail at cw@sas.sas.com



SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
URL: <http://www.sas.com/>
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1995 by SAS Institute Inc.

THE
PERFORMANCE
OF RISC AND
WINDOWS NT.
WITHOUT
THE RISK.



The NEC RISCserver™ 4200 was designed to protect your data in business-critical applications. We gave it internal RAID, UPS, an integrated service modem, and ECC memory—all of which ensure superior dependability. But equally as important is the MIPS RISC architecture itself—the same

SEE, HEAR
AND FEEL THE
DIFFERENCE™

NEC

platform Microsoft used to design Windows NT™

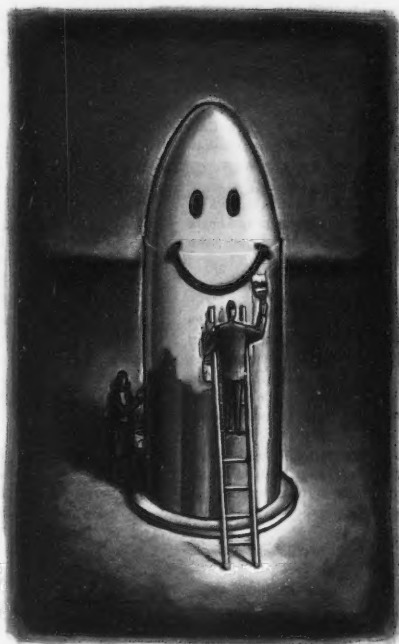
Add to that the scalability of NEC's MultiRISC™ architecture, and you have some powerful reasons to consider the RISCserver 4200. To try the RISCserver 4200, risk-free* for 60 days, call 1-800-709-3434.

RISCserver, MultiRISC and See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. All other trademarks and registered trademarks are the property of their respective owners. For information via FastFacts™ call 1-800-366-0176 and request doc. # 97774721. © 1995 NEC Technologies, Inc. *Subject to acceptance in NEC's Try and Buy program. Some restrictions apply. Key #29971

Downsizing

No magic bullet

IN EUROPE AND JAPAN, managers must find ways to flatten their companies without mass layoffs. They've yet to uncover a surefire way.



GARY WHEAT

**AN IDG
INTERNATIONAL NEWS
SERVICE REPORT**

Two words describe British information systems manager Rene Carayol: armed and unwilling. "As an IT manager, I've been given a loaded gun. Business seems to be fixated on downsizing," he says.

But Carayol, a technical director at London-based IPC Magazines, doesn't want to shoot. He'd rather retrain his staff.

Carayol has plenty of company, particularly on his side of the Atlantic. In Europe, after a decade of widespread staff reductions, many companies are shying away from layoffs. They have found that regulations make downsizing an expensive and time-consuming process. In Italy and other countries, including Japan (see story, page 82), executives fear mass layoffs will stigmatize their companies.

Now when overseas firms tighten their belts, they focus on retraining and novel organizational feats to stay competitive without slashing their ranks. How are they doing? The ideas look promising, and some programs have saved jobs. But as in the U.S., alternatives to mass firings remain difficult to find for downsizing companies.

Downsizing, page 82

**LEAN
& NICE**

Foreign firms
hope to save
jobs by:

SEEDING START-UPS

EXPLORING TELECOMMUTING

RELOCATING EMPLOYEES

RETRAINING

Downsizing: No Magic Bullet

Continued from page 81

JAPAN

Saving the salaryman

Fujitsu calls it a high-risk, high-return management experiment. In reality, it is a scheme to trim some excess management weight.

Begin last year, Fujitsu's experiment lets employees quit a company and take a chance at their own business ventures. If after three years the company is profitable, the computer giant will buy it at an appropriate market price, and the employees will get their old jobs back.

If the company doesn't make it? The Tokyo unemployment office is in *lidabashi*.

While small in scale—about 30 people have chosen the experiment, according to spokeswoman Yuri Momomoto—the Fujitsu project illustrates that Japanese companies are trying to weather their country's three-year recession without U.S.-style layoffs.

In a country where cradle-to-grave job security is often expected, companies are under heavy social pressure to hold on to workers even through financially tough times.

As a result, many high-profile Japanese companies have found ways to shed workers without public backlash. Their methods include attrition, relocation and reassignment to subsidiary suppliers in the same business groups.

Big steel companies, including NKK and Kawasaki Steel Corp., have followed this path. By next March, NKK expects to lose 4,800 workers, most of whom will be reassigned among the company's myriad subsidiaries.

Despite efforts to reduce labor costs, a huge midsection of white-collar managers still needs to be slimmed and made more productive if Japan hopes to regain its industrial might, consultants say.

"They just tinker with what they've got, but eventually they've got to go on a strict diet plan if they want to survive," says one U.S. consultant in Tokyo.

— Rob Guth, an IDG News correspondent in Tokyo

SEEDING START-UPS

An alternative to layoffs is the practice of seeding employee- or government-owned firms. Digital Equipment Corp.'s plan to reduce its workforce by 20,000 employees worldwide, announced last summer, led to strikes and picketing at some European sites. Last October, the company's German subsidiary decided to spin off one-third of its workforce into a separate, employee-owned company, saving 1,500 jobs.

The new company, called Ditec Informationstechnologie GmbH & Co. KG, will be partly financed by Digital. And Digital will ensure the salaries of the employees during the first year.

A similar solution was found at Alcatel SEL, the telecommunications giant's German branch. Alcatel saved jobs by making arrangements with municipal governments to take over some production facilities and employees and convert the plants into high-tech centers. In Mannheim, Germany, for example, 300 to 400 of the company's 570 positions will be saved, said Joachim Klein, a spokesman for Alcatel.

RETRAINING

Retraining is popular with labor unions, lawmakers and IS professionals.

In Germany, union officials and an IS association called the Network of Computer Science Professionals issued a first-ever joint declaration in April demanding training for IS specialists.

Last September, the European Union issued a directive to ensure that companies soften the impact of any corporate strategies that affect head count. The directive included retraining or job placement schemes.

But while many praise retraining as a way to gain loyalty and improve employee efficiency, it isn't a panacea.

After downsizing in the early 1990s, Baxter Health Care has found computer training is not necessarily a substitute for the experience lost. The company has retrained some non-specialist employees such as those working in administrative positions, but results have been mixed.

"The computer is only a tool. If the person has no idea how to use it, then [retraining] doesn't help," says Alberto Rivas, supervisor of IS operations at Baxter Europe in Valencia, Spain, a subsidiary of the U.S. health care firm.

EXPLORING TELECOMMUTING

Consultants and IS vendors consider telecommuting (known as teleworking in Europe) a promising way to retain skilled workers sometime in the future.

"It is much more expensive [to lay off personnel] in Europe than in the U.S. That is hard to understand by some [of my] colleagues in the U.S."

Jean-Paul Loup, vice president of human resources, IBM's Europe, Middle East and Africa division

"I don't see any real experimentation yet," said Gianni Marchetti, secretary general of UILM, an Ivrea, Italy-based union that represents workers at Italian computer vendor Ing. C. Olivetti & Co. "It will be years before we see any benefits from ideas like teleworking."

Cost is an obstacle, even though Integrated Services Digital Network lines are reasonably priced in Europe. Olivetti managers calculate it would initially cost about \$6,250 per person to equip each teleworker, according to Renato Casarotto, director of corporate human resources development, recruitment and training at UILM.

Managers also have a hard time envisioning how to organize telework for administrators. Still, Casarotto says he expects teleworking will reduce office infrastructure costs and travel time and is convinced telecommuting will take off in three to five years.

CREATING NEW JOBS THROUGH TECHNOLOGY

Some European managers make the argument that while information technology makes some jobs obsolete, it also spurs job growth in new areas. For employees and employers alike, the process is one of taking a step backward in order to take one or two forward.

Alliance & Leicester Building Society, a newly merged \$14 billion company in Leicester, England, has had to lay off personnel with overlapping responsibilities in the past two years. However, new telemarketing jobs were created after the company installed software that tracks and manages telephone calls for telesales employees.

"You could say that while information technology has not helped us avoid layoffs in some areas, it has helped create a new market and employment in others," says Alan Jackson, head of resource management for the group information services unit at the company.

But even if new jobs are created, there's no guarantee that the IS personnel who create these systems will remain with the same employer.

Car rental agency Europcar recently installed a computer system that will make its reservation system identical in each of its European offices. The system didn't result in layoffs, but Europcar outsourced most of its IS operations and personnel to Perot Systems Corp., said Malcolm Stirling, technical director at Europcar in Villepinte, France.

In short, while start-ups have saved some jobs, U.S. IS managers hoping to find ways to downsize won't find many solutions overseas. Still, the efforts of foreign managers bear watching. If European managers don't find a magic bullet soon, the pressures of global competition will tear Europe's social safety net more than most Europeans can bear. ■

Written by IDG News correspondents, Marc Ferranti and Cara Cunningham in Paris, Elizabeth de Bony in Brussels, Ron Condon in London and Torsten Busse in Munich, Germany.

FRANCE

Laying off is hard to do

Reducing head count in Europe is a long, costly process. Just ask executives at IBM France.

Europeans are supported by a web of European Union and national labor laws intended to blunt the effects of employee reduction measures. These rules make layoffs a burden for employers.

"It is much more expensive [to lay off] in Europe than in the U.S.," says Jean-Paul Loup, vice president of human resources at IBM's Europe, Middle East and Africa division, based in Paris. "That is hard to understand by some [of my] colleagues in the U.S."

For example, the French government and unions are involved every time an employee leaves a company, even voluntarily. And because French workers sign binding employment contracts, the process gets even longer when workers disagree with a company's re-engineering plan.

IBM France in October 1993 proposed a cost-cutting plan that involved laying off 3,000 workers. Following negotiations—during which the plan was modified to lay off only 1,700 employees and reduce all salaries by 7%—the plan was approved in November 1994 by the workers, with the support of the French labor minister.

But two of IBM France's five unions disagreed with the plan, and negotiations moved to the courtroom. Early this year, the company won, and its plan was finally enacted.

At one point, IBM France asked workers if they would agree to saving 1,300 jobs by taking a pay cut. While 95% agreed, 5% didn't. Because no bilateral agreement was reached with this minority, employees at IBM France can't modify their contracts.

— Marc Ferranti and Cara Cunningham, IDG news correspondents in Paris



"I want to be able to scope out
every nook and cranny of my system."



IBM Solution # 29465-L



a.k.a. "NetFinity™ Systems Management"

To get the lowdown on your system, we suggest you start with NetFinity software. Installed on every PC 700, it gives you the power to detect your hard drive capacity, how much memory you've got, which adapter cards are installed and more. And

- New, sharper color monitor
- Easy Tools software
- NetFinity—part of the SystemView® family
- System inventory

control



- Remote systems management
- Early problem detection
- Capacity planning

• Fax ID # 3468

FOR DETAILS ON PC 700s, CALL 1 800 772-2227*

it can provide this on up-to-the-millisecond reports for even closer inspection. Ensuring, in short, glaring analysis and relentless scrutiny. So you'll never be left clueless. The IBM PC 700. One more reason there is a difference.™

IBM

*In Canada, call 1 800 465-7999. Product availability may vary. IBM and SystemView are registered trademarks and NetFinity and "There is a difference" are trademarks of International Business Machines Corporation. ©1995 IBM Corporation.

Management

MANAGEMENT

Human Resource Management Services/Expo '95: The National Human Resources Information Technology Exposition and Conference. San Jose, Calif., **Sept. 18-20** — Topics: human resources strategies and tactics, client/server applications, payroll and retirement systems, project management and human resources implementation, benefits and business process re-engineering. Contact: Dave Code, Blenheim NDN,

Inc., Mountain View, Calif. (800) 232-3976.

The Second Annual National Business Process Re-engineering (NBPR) Conference. Arlington, Va., **Sept. 18-21** — Free conference will discuss how to identify and deal with the effects of re-engineering on employees and organizations; bene-

fits, drawbacks and effective use of rapidly changing business process re-engineering tools to support re-engineering efforts; and the latest innovative technologies and capabilities, such as Internet and document management used to support re-engineering activities. Contact: NBPR '95, Falls Church, Va. (703) 761-0646.

The Information Technology Outsourcing Institute: Designing, Negotiating and Implementing Deals. San Francisco, **Sept. 20-21** — Seminars include: "Developing Airtight Request for Proposals: Strategies of the Most Successful Purchasers"; "Objective and Subjective Metrics for Evaluating Vendor Proposals"; and "How to Obtain Competitive Pricing Throughout the Terms of the Deal." Contact: BDA, Inc., Washington (800) 394-9390.

The 1995 Computer Training and Support Conference. Orlando, Fla., **Oct. 1-4** — Sessions include: "Emerging Technologies: Looking in the Crystal Ball"; "The Next Wave: Technologies for the Mobile Professional"; "Virus and Network Security Policies That Work"; "Software Licensing"; and "JAD, RAID and Software Development Methodologies." Keynote speakers: David Prentice, president of Learning Corp., on "Super-Charged Customer Service: A Personal Statement of Excellence"; Sue Miller Hurst, director of the Starshine Foundation, on "The Learning Edge"; and Elliot Masie, president of the Masie Center, on "Why Computer Users Say the Strangest Things." Fee: \$895. Contact: Soft Bank Institute, Medford, Mass. (617) 393-3344.

Re-engineering for Managers and Executives: Moving Benefits to the Bottom Line. Cambridge, Mass., **Oct. 11-13** — Topics include: re-engineering overview, managing the process, change readiness, mobilization, visioning, case for action and re-engineering in practice. Contact: Kendall Institute, Inc., Scituate, Mass. (617) 544-3844.

INDUSTRIES

Cable Telephony '95. Denver, **Sept. 19-20** — Topics: "The Business Case for Cable Telephony"; "Cable Telephony Prescriptions for Success"; "Making It Work: Overcoming Technical and Operational Hurdles"; and "High-speed Data Service Deployment and Wireless Cable Telephony Delivery." Fee: \$985. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Government Technology Conference East '95. Albany, N.Y., **Sept. 20-21** — Contact: Maureen Torncello, Government Technology, Albany, N.Y. (518) 435-1106.

Stored Value Cards: Implementing State-of-the-Art Electronic Cash Applications. Washington, **Sept. 21-22** — Seminars include: "Taking Immediate Advantage of 21st Century Smart Card Opportunities"; "Visa Stored Value Cards: Capitalizing on the New Global Currency"; "Which Comes First — Commerce or Finance"; "Moving Beyond the 'New Toy' Technologies: How to Attract New Customers with Benefit-Packed Stored Value Card Systems"; "Building A Fully Functional Security and Card Operating System." Contact: The Center for Business Intelligence, Burlington, Mass. (800) 767-9499.

1995 NASIRE Annual Conference. San Antonio, **Sept. 25-27** — Theme: "Founding the Information Republic: Meeting Citizens' Needs." Fees: \$295 for government employees, \$395 for National Association of State Information Resource Executives (NASIRE) members, \$595 for corporate nonmembers, \$100 for guests. Contact: NASIRE, Lexington, Ky. (606) 231-1905.

Graph Expo. Chicago, **Oct. 8-11** — Topics include: CD-ROM, on-line databases and direct digital and decentralized publishing through wide-area business networks. Contact: Graphical Arts Show Co., Reston, Va. (703) 264-7200.

USER GROUPS

The International Function Point Users Group (IFPUG) 1995 Fall Conference. Toronto, **Sept. 18-22** — The conference will feature a variety of software metrics and project management topics, a training course on function point analysis, project estimating, management software measurement and quality and process improvement programs. Contact: David Longstreet, IFPUG, Westville, Ohio (614) 895-7130.

Unix Expo. New York, **Sept. 19-21** — Sponsored by the New York LAN Association. Contact: Laura McQuaid, Blenheim Group, Fort Lee, N.J. (800) 829-3976, ext. 384.

XDB Sixth Annual International User Conference. Baltimore, **Sept. 19-22** — Fee: \$675. Contact: Connie Handen, XDB Systems, Columbia, Md. (800) 488-4948.

SECURITY

VB '95: Virus Bulletin's Fifth Annual International Conference. Boston, **Sept. 20-22** — Topics include: introductory session on computer viruses, problems encountered by corporate security managers and what the technology will look like at the turn of the century. Contact: Virus Bulletin Ltd., Ridgefield, Conn. (203) 431-8720.

TECHNOLOGIES

Client/Server Economics Summit. Washington, **Sept. 18-20** — Topics include: distributed systems support, advantages of deploying a request-tracking system, applying advanced systems and profiting from emerging technology, controlling the cost of migrating to client/server, networking challenges of client/server and deploying mission-critical systems in a client/server setting. Fee: \$1,195. Contact: Mary Clare Bennett, Client/Server Economics Summit Registration, San Francisco, Calif. (415) 905-2267.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO:

David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931.

GREAT SOFTWARE IS ONLY HALF OF THE SOLUTION.



Karen Druffel
Consultant

Robert Kaunert
Senior Consultant

Aaron Charbonnet
Area Manager

Software, no matter how advanced, is really just a tool. Like any tool, it's most useful if it's in the hands of someone who can maximize its potential.

At The Hunter Group, we've made it our business to pair the most brilliant minds in Human Resources and Financial systems planning, reengineering and package implementation with the world's most advanced software.

As a result, The Hunter Group is a global leader in HRMS and Financial Accounting systems consulting.

We've built our reputation around uncompromising quality and hundreds of client successes.

We provide services ranging from strategic planning and business process reengineering to systems selection and integration, including complete implementation support of the latest client/server applications.

We're certified Implementation Partners with today's most progressive vendors: PeopleSoft, Dun & Bradstreet Software, Computron, Ramco, Edify and Essence. We support applications throughout North America, Europe and the Asia/Pacific countries.

Call our global headquarters to learn about The Hunter Group.
Call (410) 576-1515 Fax (410) 752-2879
Or write to us at the address below.

Become part of the solution. Join The Hunter Group.

We have openings for HRMS and Financial systems consultants, technicians, business analysts and practice leaders throughout our network of offices in North America, Europe and the Asia/Pacific region.

Prospective candidates must have a passion for success, a commitment to quality work, and enjoy an entrepreneurially spirited company and the opportunities it provides. Prior "Big 6" or other consulting or client-service experience, or practitioner experience implementing client/server systems and technologies, is required. Experience with PeopleSoft HRMS or Financials, DBS SmartStream™ products, Computron's n-Dimensions, or Integral's InPower HR series is a definite plus.

Join us for a fast-paced career, and become a part of the industry's global leader in HRMS & Financial Systems consulting. Send cover letter and résumé to: Recruiting Department, The Hunter Group, Inc., 100 East Pratt Street, Suite 1600, Baltimore, MD 21202. Or fax to: 410-752-2879.

**The
Hunter
Group, Inc.**

Global Headquarters: 100 East Pratt Street • Suite 1600 • Baltimore, MD 21202 U.S.A.
Atlanta • Baltimore • Boston • Chicago • London • New York • San Francisco • Singapore



"Surprise me. Give me more power
than I thought I could get for my money."



IBM Solution # 111163-J



a.k.a. "Affordable Pentium Technology"

If you're looking for a lot of performance for not a lot of money, consider the new IBM PC 300. Pumped up with a 75 or 90MHz Pentium® chip and 64-bit graphics, it delivers all the speed and functionality you need for off-the-shelf

- 75/90MHz Pentium processors
- SelectaSystem™ DOS/Windows™ and OS/2® Warp
- 64-bit graphics



- 3-year warranty*
- IBM HelpWare®
- 540/850MB HDD
- PCI/ISA bus architecture
- Fax ID# 3467

FOR MORE DETAILS ON PC 300s, CALL 1 800 772-2227*

or customized applications. And it starts at just \$1825¹ (monitor not included). Which means you can take on the heavy stuff without getting in over your head. The IBM PC 300. One more reason there is a difference.™

IBM

*Entry-level PC Direct price for 75MHz/540 HDD. Dealer prices and product availability may vary. IBM's Statement of Limited Warranty is available upon request by calling 1 800 772-2227. *In Canada, call 1 800 465-7778. IBM, OS/2 and HelpWare are registered trademarks and SelectaSystem and "There is a difference" are trademarks of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. Windows is a trademark of Microsoft Corp. ©1995 IBM Corporation.



MARISA HERNANDEZ
IS ALIVE and
her mother will forever
hold a place in her heart
for the doctors of
Texas Children's Hospital.

PERHAPS, if she
knew more about the role
of reusable objects in
the development process,
there'd be *room* for
us as well.

When you're dealing with very sick kids, the consequences of getting the right information to the right place at the right time are monumental. To say it's a matter of life and death is fact, not hyperbole. The people of Texas Children's Hospital were all too aware of this and set about building a system that would ultimately place a patient-record workstation in every room. A system that would automate clinical information for more accurate diagnoses and improved treatment. A system that would become as integral a part of ensuring quality healthcare as the stethoscope. A system they built with PowerBuilder® Enterprise.

PowerBuilder® provides complete database independence, allowing you to choose among Informix, Microsoft™, Oracle®, Sybase, DB2® and others. With Windows® 3.1 and NT currently supported, and Windows 95 and others



on the way, PowerBuilder lets you build applications across the leading graphical environments. With the complementary technology of our CODE partners, you can extend your capabilities and build sophisticated, two and three tier applications.

By reusing objects, development with PowerBuilder became faster and more intuitive while, at the same time, more sophisticated. PowerBuilder's openness provided native connectivity to Microsoft's SQL Server database. And PowerBuilder's RAD prototyping allowed a flexible, iterative design process that involved end-users, creating an application that matched their needs. Now there are workstations that Texas Children's Hospital just can't do without. Just ask the doctors. Or, better yet, ask Marisa Hernandez's mother.

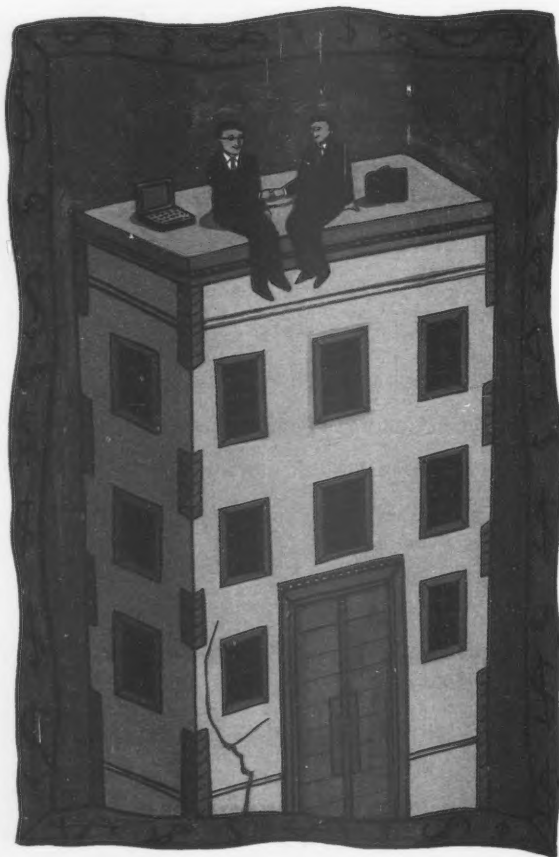
For more information about how Powersoft can help you change your business, call us at 1-800-395-3525.

The CW Guide to Client/Server Financials

Settling Cracks

By Paul
Korzeniowski

Problems can show up
in a move to client/server
financials, but you will reap
benefits in the long run



The *Seattle Times* decided a few years ago to bite the bullet: It would cap its mainframe expenses by moving applications needing major modifications to a client/server platform. "We knew the transition to the new software would be painful," says Laurie Stanton, finance accounting manager at the newspaper. But last year, the company was able to hold its mainframe costs in check, Stanton adds.

In making its decision, the newspaper focused on easy-to-measure costs such as the price of PCs and Unix workstations compared with mainframes, Stanton says.

That line of thinking may be typical. Interviews with corporate managers indicate that they seem comfortable with relatively cursory looks at hidden expenses such as training. Thus, with mainframe costs in the millions of dollars and the combination of PCs and servers priced at about \$100,000, the decision to move to client/server can be a no-brainer.

Consequently, droves of companies are making or planning moves to client/server systems, and financial systems are among the first applications altered. Clare Gillan, an analyst at International Data Corp. in Framingham, Mass., projects that worldwide sales of client/server financial systems will grow from \$922 million in 1994 to \$3.7 billion in 1999.

But the corporate stampede and promise of savings don't lessen the initial transition quakes or eliminate flaws in what may prove to be a generally successful strategy.

Valteck, Inc., an automobile components manufacturer in Springville, Utah, paid the price in terms of training when it switched from The Ask Group, Inc.'s Manman system running on a Hewlett-Packard Co. HP 3000 minicomputer to a Unix platform and Oracle Corp.'s Oracle Financials.

Valteck hired four full-time consultants, and a team of 25 employees

COMPUTERWORLD

Professional Courtesy Voucher

☐ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.05 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.
For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price

~~\$48.00~~

Your Special Rate

\$39.95

Your Savings

\$8.05

E4H5-2

COMPUTERWORLD

Professional Courtesy Voucher

☐ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.05 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.
For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price

~~\$48.00~~

Your Special Rate

\$39.95

Your Savings

\$8.05

E4H5-2



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1131 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPT
375 COCHITUATE ROAD
FRAMINGHAM MA 01701-9494



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1131 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPT
375 COCHITUATE ROAD
FRAMINGHAM MA 01701-9494



Client/Server Financials

worked for six months on making the transition.

"Problems arose because our users did not understand client/server software and the consultants did not know how our business operated," says Greg Crandall, Valteck's director of marketing and information systems. "The change created a great deal of frustration."

Fruits of the labor

The good news is that Valteck was able to cost-justify its \$5 million investment.

First, Valteck was able to measure its return on investment by revenue per employee. When the company began installing the Oracle software, each employee generated \$118,000 in revenue. The number has risen to \$130,000 per person and the 1998 goal of \$140,000 per employee is in sight. Company officials say employees are more productive because of the num-

ber of tasks the system automates.

Second, the company's inventory system included many manual checks. The system automated those

reduced errors and enabled tasks to be completed more quickly. The company expects to cut its accounts receivable turnaround from 62 days to 50

The corporate stampede and promise of savings don't lessen the initial transition quakes or eliminate flaws in what may prove to be a generally successful strategy.

functions, so the company manages its inventory more efficiently.

Also, the accounts receivable area eliminated manual input, which re-

duces the amount of interest it pays on its bills and collect more bank interest on its receipts.

Client/server based financials were also a nice fit for PRC Corp. in McLean, Va. The \$1 billion systems integrator decided in the fall of 1992 to replace its host-based Dun & Bradstreet Software financials package with a client/server system. Kelvin Goon, a vice president and general manager at PRC, says the mainframe system was expensive. It cost \$2.5 million per year to maintain and required a team of 50 employees who were responsible for enhancing the applications.

At the end of last year, PRC replaced the mainframe system with financial and human resources software from PeopleSoft, Inc. By making the switch, PRC cut its annual computer maintenance cost to \$250,000 and its support staff to 25. Goon says he expects the company to recoup its \$10 million investment in less than four years. The extra 25 program-

Settling cracks, page 90

Client/server sampler

The following are leading client/server applications, identified with the assistance of several industry analysts. Summary comments are from Jeff Comport, a research director at Gartner Group, Inc. in Stamford, Conn.

R/3 SAP America, Inc. Philadelphia (800) 872-1727	High-flying integrated vendor. Will it be able to simplify technology and implementation for more modest-size organizations?	Lawson Accounting System Lawson Software, Inc. Minneapolis (800) 477-1357	Most successful of AS/400 vendors in re-launching into open systems market. Functionality is aimed more at mid-size organizations.	Flexifinancials FlexInternational Software, Inc. Shelton, Conn. (203) 925-3040	Object-oriented approach and Microsoft alliance are keys to launching start-up.
Oracle Financials Oracle Corp. Redwood Shores, Calif. (800) ORACLE-1	Integrated vendor seeks to control your database tools and application strategy. Challenge is to create better business domain knowledge.	Open Accounting System Coda, Inc. Manchester, N.H. (603) 647-9600	Very high-function integration and strong cross-platform support.	SQL Financials 3.02 SQL Financials International, Inc. Atlanta (404) 390-3900	Gupta tool advocate sporting strong user interface and growing client list.
Financial Stream Dun & Bradstreet Software Atlanta (800) 234-3867	Turned the corner in relaunching with Stream products as flagship line. Still much inertia to overcome.	SQL Enterprise and Platinum for Windows Platinum Software Corp. Irvine, Calif. (800) 999-1809	Back after disastrous year. Relaunching on coattails of Microsoft's Windows 95 and Windows NT.	ACCPAC/2000 System Computer Associates International, Inc. (800) 225-5224	Product maintenance specialist focusing more on client retention than new account acquisition.
PeopleSoft Financials PeopleSoft, Inc. Pleasanton, Calif. (800) 947-7753	Will expansion into distribution and manufacturing markets cause PeopleSoft to take its eye off the ball in fleshing out functions in its financial suite?	Dynamics C/S+ Great Plains Software, Inc. Fargo, N.D. (800) 456-0025	LAN specialist eyeing more mid-market organizations via Windows NT.	Infinium Financial Management Software 2000, Inc. Barnstable, Mass. (800) 725-7668	One of the best user interfaces, still stuck on the AS/400 pending delivery of a Unix product.
Renaissance CS Series Ross Systems, Inc. Redwood City, Calif. (415) 593-2500	Challenge is to reconcile inconsistency between its financial suites and tools.	Openseries Financials The Dodge Group, Inc. Waltham, Mass. (617) 487-0025	Finally has product on the market. Specializes in process engineering. Still must flesh out financial suite.	Computron Financial Software Computron Software, Inc. East Rutherford, N.J. (800) 828-7660	Solid workflow integration, refocused on customer support.
Hyperion Financials 1.0 Hyperion Software Corp. Stamford, Conn. (203) 321-3500	Dominates analytical accounting market. Brand new entrant to transition accounting.	KaPre Financial Manager and KaPre Business Process Integrator KaPre Software, Inc. Boulder, Colo. (303) 938-8805	Object-oriented fanatic. Still must get product out the door.		

Settling cracks

CONTINUED FROM PAGE 89

mers were assigned to other projects.

Amoco Canada Corp. in Calgary, Alberta, moved from an internally developed financial system to mainframe-based D&B Software's financials in 1991. The oil company took steps to reduce its mainframe costs two years later, about the time D&B Software unveiled its SmartStream suite of client/server applications. So Amoco Canada signed up as a beta-test site.

The company expects to save \$2 million to \$3 million per year by off-loading reporting functions from the mainframe, says Zuhair Shlar, manager of financial and administrative systems. A second, softer benefit is easier user access to data: SmartStream includes point-and-click features so that users can more readily examine financial data.

The flexibility found in a client/server financial system attracted International Shipholding Corp. in New Orleans. Historically, the company's 100 users relied on timeshared access to

an IBM 3090 mainframe. Sheila Dean, director of internal auditing at the shipbuilder, says the mainframe didn't work easily with LANs, made it difficult for users to share information and carried high maintenance costs.

So International Shipholding moved to an HP Series 9000 system and replaced its customer financial system with Lawson Software, Inc.'s Lawson Software. Dean says the system includes prepackaged reports so end users don't have to spend time designing them.

Technical limitations

Besides the commitment to significant training, companies found technical limitations with client/server systems. Dean's only complaint was that the Lawson system didn't offer more client/server capabilities. She says the package supports only rudimentary Windows features and that most of the processing is done on the server.

Many applications currently marketed under client/server labels still rely on character-based mainframe or midrange systems.

Those vendors have added client/server capabilities, but the progress has been minimal. With many of the systems, the server does the bulk of the processing, and the client merely presents information to a user.

PRC selected PeopleSoft financials because they were designed from the ground up as a client/server system. "Because PeopleSoft did not have to migrate its features from a character-based system, we thought the company offered better GUI capabilities than other products," Goon says.

Users report improvements in other systems. Shlar says SmartStream's client/server capabilities have improved with each release. The package is now powerful enough to support more complex processing, he says.

As vendors deliver more improvements to their products, the decision to move to client/server will become even more of a no-brainer.

Korzeniowski is a freelance writer in Malden, Mass.

Financial tools slide into workflow

By Scott McCready and Judy Hodges

Workflow is hot, particularly in the financial software community. But before you rush out to buy new applications or workflow-enable your current ones, it might help to know just exactly what workflow is and the business benefits it delivers.

Workflow can be as simple as a software capability that allows you to route a document from one person to another or as sophisticated as a process-oriented means of getting more data and work through the system. It's this notion of more efficiently managing work processes that has captured the imagination of prospective customers and financial software vendors.

Workflow features and functions, and the fundamental architectural approach taken, tend to vary greatly across products. Consequently, when it comes to workflow, the watchwords are "buyer beware." The following are some key points to consider when assessing your workflow needs:

- Simple workflow products that allow you to easily route work from one person to another generally don't lead to any great revolution in productivity. These tools deliver a suitable way for companies that are risk-averse to rise incrementally on the workflow learning curve.
- Accounts payable is one of the simplest workflow applications to undertake, and the productivity benefits it yields are easily demonstrable, ranging from 25% to 35% per person. At that rate, a multimillion-dollar system can pay for itself in less than 18 months.
- Most companies benefit significantly from having workflow independent of, rather than embedded within, their financial applications. A separate workflow system permits the business process to dynamically respond to



the needs of the marketplace without requiring IS staff to rewrite the application.

- Because workflow delivers a competitive advantage, your peers may not be advertising their investments in this leading-edge technology. If you don't use workflow but compete with The Boeing Co., General Electric Co., Exxon Corp., Pizza Hut, Inc., The Goodyear Tire & Rubber Co. or Kraft General Foods, Inc., your organization is already at a competitive disadvantage.
- Workflow offers not only a shot in the arm from a competitive perspective but a continuous method in which to constantly improve and evaluate your financial operations. You can select a workflow-enabled financial application from a wide variety of vendors, including SAP America, Inc. and D&B Software. Or you can choose a vendor package that adds workflow to your current financial software such as those marketed by companies including FileNet Corp., Recognition International, Inc., ViewStar Corp., Wang Laboratories, Inc. and Computron Software, Inc.

There is no shortage of choice when it comes to workflow. However, bear in mind that the highest and best use of workflow is in support of a well-designed work process.

McCready and Hodges are analysts at International Data Corp. in Framingham, Mass.

Tech notes

A year ago, a *Computerworld* staff member who had dealt with a horde of client/server software companies observed that "about 300" was the standard answer vendors gave when asked how many user sites they had. In reality, there typically were only a couple dozen sites.

Today, firms selling client/server financial applications respond to that question by saying "about 30" or "about 100." Maybe they don't exaggerate as much as their predecessors in the client/server tools, human resources and manufacturing markets. Instead, those offering financial packages are more likely to boast, "We don't have the most sites, but we do have the best technology." (Substitute "complex installations" or "biggest sites" for "best technology" if you wish.)

Take a close look at the "about 30" and "about 100" figures, and you'll likely find that at least half of those user companies have implemented only a couple of modules of the financial package. They still run host/terminal versions of the vendor's software, or they have installed the client/server software at a fraction of their locations.

These vendors aren't lying. Like other Polyannas, they are optimistic. Anyway, nobody can really prove them wrong because this technology really is new. It will be a while before the vendors shake out.

If IS managers want to move into the world of client/server financial software, they have to travel through Missouri first. Take a "Show Me State" attitude not only by testing the client/server application with your own data and business rules, but by conducting your own interviews with customers in environments comparable to your own.

The lead story in this Guide provides evidence that there are benefits to be had in a move to client/server financials—one of the more crucial application sectors in any corporation. However, the accompanying Buyers' Satisfaction

Scorecard (see page 93) shows that even in a single vendor's user base, product performance varies greatly. So step onto this leading edge with care.



JAMES M. CONNOLLY
Technology
evaluations editor

Computerworld's Guide team welcomes user comments on upcoming CW Guide topics, including large-scale servers and network operating systems. Are products in those areas meeting your expectations? What are your greatest headaches or benefits from those technologies? Send E-mail to james_connolly@cw.com.

Find out why Skadden Arps, one of the world's largest law firms, trusted Lawson at <http://www.lawson.com> or 1-800-477-1357.



© 1995 Lawson Software

IT'S LIKE INVESTING IN BUSINESS SOFTWARE. IF YOU'RE SMART YOU ONLY DO IT ONCE.

Sure, you might get lucky. On the other hand, you've got a lot to lose. That's why, when purchasing software, you'd better know exactly what you're getting into.

For example, Lawson Software supports all the leading client/server platforms. So no matter what hardware system you move to next, we'll be running

on it. And you can migrate through technological changes and upgrades without additional licensing fees.

Finally, twenty years of experience has resulted in some pretty amazing functionality. Ask our users.

Lawson Software. For accounting, human resources, distribution and materials management. We're making it as painless as possible.

LAWSON
Software™

THE LAST TIME YOU'LL CHANGE
SOFTWARE COMPANIES.

On May 6, 1962,
Earl Whitney
of Gumpah, Wisconsin,
caught a 205-pound perch
with a gold bar in its...
STOMACH.

Next week his brother Neville
caught a bass with a similar bar
in its stomach.

The ID numbers
imprinted on the gold bars
were exactly the same
as the brothers'
social security
numbers.

IT'S ABOUT AS LIKELY AS FINDING
A DEFECT IN ONE OF OUR SUPPLIES.



With Lexmark printing supplies, defects are amazingly rare, given our 99.84%* defect-free record. So you get supplies that last longer and do more. That's because we design our supplies to be perfectly compatible with the machines that use them.

And as a former division of IBM®, we have a rich heritage of providing highly reliable, as well as highly advanced, products.

For example, the Lexmark 4076 Print Cartridges, used in our new WinWriter 150c ink jet printer, deliver vibrant colors and true black printing.

So don't leave yourself vulnerable to defects. Protect yourself with Lexmark. Our supplies are more than dependable. They're legendary.

Call for a catalog or the dealer nearest you. 1-800-438-2468.

LEXMARK™

ADVANCING THE ART OF PRINTING

*Based on random sample testing of our complete product line. Lexmark Supplies are manufactured under the International Standard (ISO 9002) approved quality process. IBM is a registered trademark of International Business Machines Corporation in the United States and/or other countries and is used under license. Lexmark is a trademark of Lexmark International, Inc. ©1995 Lexmark International, Inc.

PRINTING SUPPLIES BY LEXMARK. LEAVE NOTHING TO CHANCE.

Users find benefits but yearn for value

It's early in the game for user sites running client/server financial applications. The installation bases may be small compared with mainstream products such as servers and network operating systems, and many users still aren't in full production.

However, first reports from the field show that the client/server financial suites offered by four of the major business applications vendors are generally performing well and providing users with benefits.

Computerworld and First Market Research in Austin, Texas, contacted 33 users of Oracle Corp.'s Financials



By Kevin Burden

and 30 users of Dun & Bradstreet Software's SmartStream Financials and located 18 users running PeopleSoft, Inc.'s Financials and SAP America, Inc.'s R/3.

More than half (57%) of all users interviewed said the overall performance of their chosen package was better than average, and only seven users said performance was poor. In addition, more than 80% of the respondents said their goals of improving information flow and management decision-making were achieved as a direct result of their chosen application.

Burden is Computerworld's senior researcher, Firing Line/Scorecard.

Rounding out the field

Five of the 10 SAP R/3 users who were contacted said performance was good; the other half gave an average rating.

Of the eight PeopleSoft users interviewed, only two gave performance a good rating; the remaining six gave it an average rating.

According to users, PeopleSoft's strengths are in its security, where six respondents gave a rating of good. Also, reliability and value both received good grades from half the respondents.

SAP R/3's strengths also lie in reliability and compatibility with the network. Half of its users said reliability was good or very good, and six of the 10 users said compatibility was good.

Overall performance

Number of users

Very poor

Poor

Fair

Good

Very good

Oracle's Financials

0

2

4

21

6

D&B Software's SmartStream

2

2

14

11

1

Reliability

Given the consequences of a failing financial system, it's no surprise users rated reliability as most important.

The number of Oracle users who said reliability was good or very good was more than double the number of D&B Software users offering those same ratings—a trend that carries through this Scorecard. However, many of the D&B Software users who rated SmartStream as average noted that they didn't experience problems.

How could D&B Software better its reliability? Several users said security could be improved. "Better security would be the difference between good reliability and completely worry-free reliability," one D&B Software user says.

Compatibility

Network and operating system compatibility is at the forefront of users' concerns. Users of both D&B Software and Oracle applications said the products worked well with Unix and Microsoft Windows NT operating systems. But setting them up for the network was difficult. "It works like a gem under Unix," one Oracle user running the HP-UX flavor says. But when asked about network compatibility, the user added, "Setting it up for NetWare was confusing—we needed a lot of help."

Similar comments by users of both packages indicate network problems were often caused by lack of experience with the architecture.

Although the number of Oracle users giving favorable scores was more than double the D&B Software users in both these categories, D&B Software didn't receive negative marks on compatibility.

Value for the dollar

Users have yet to recover their investment in the Oracle and D&B Software products. Users said the importance of value returned for the dollar is very high. Unfortunately, interviewers spoke with few users of either package that could give value a favorable rating. Many criticisms focused on the large overall investment and the long wait before any return is seen.

Other comments centered on both applications' inadequacies in moving older data to the new system. "Manually transferring data over has made this a very expensive project," one D&B Software user says.

EDITOR'S NOTE: The Oracle users were interviewed prior to the company's recent integration between its tools and applications.

Security

Users frequently cited security as an area in which vendors should direct much of their future attention. While this criticism was made by users of both packages, D&B Software users said it a little louder.

Oracle users were less critical. More than two-thirds of the respondents gave its security favorable ratings. Comments included "extremely secure and very manageable" and "[user] access rights are easy to oversee."

Users of both the D&B Software and Oracle packages complained about problems with front-end editing tools. "Incorrect data can be entered if not careful," one Oracle user says.

"We've never had problems with data integrity or unauthorized access," says one D&B Software user, noting, "it's the editing and accuracy controls that need the work."

Support

Users of almost any product will say vendor support can always be better. These users are no different, but they kept their complaints to a minimum.

Users characterized Oracle support with comments such as "very knowledgeable and experienced support team" and "they answer our questions immediately if we tell them the severity of our problem."

Comments from D&B Software users included "they respond and follow up very quickly" and "they are extremely fast problem solvers."

However, on-site support is where both vendors stand to improve, users say. Few users awarded favorable grades for this support level, but those that did said on-site support was most helpful during implementation. After that, "it becomes too expensive to keep up."

	Good	Very good		Good	Very good		Good	Very good		Good	Very good		Good	Very good
Oracle	12	15	With network environment	6	9		9	5		12	9	Telephone	10	6
			With operating system	12	10							On-site	3	4
D&B Software	7	6	With network environment	5	1		7	0		6	3	Telephone	7	3
			With operating system	6	4							On-site	1	2

GREGORY MICHAEL
Network Enable Sales Representative

UNISYS

Unisys Corporation
Township Line &
Union Meeting Roads
Blue Bell PA 19424-0001

Novell
Cabletron Systems
Cisco Systems
Chipcom
Microsoft
Attachmate
Ascom Timeplex
Airlana
Tricord Systems

3COM
UCI
CompUSA
CPS
DSI
Patton
Memotec Communications
Hitachi
IDEK
Olicom

JBM
Multi Tech
Telebit
Computer Peripheral
Premises One
Deltoc
TechData
Emerson/Liebert
Exide
Express Cables

Unisys Network Enable.

The one source for
the many resources your
network requires.

Building a multivendor network is not for the impatient, the easily depressed or the faint of heart. Just ask anyone who's tried to find, choose and manage dozens of vendors themselves.

Unisys Network Enable is an easier, more efficient way to solve the problem.

With worldwide depth and expertise, we specialize in designing, installing and maintaining network solutions in multivendor environments.

This means that all you have to do

is make one call and we can bring you the best possible solutions, no matter who happens to make them. And that includes over 9,000 products from over 130 vendors.

Besides providing you with the advantages of a single, fully accountable resource, there are many other reasons to call Network Enable.

For example, there's our impres-

sive range of services. These include the creation and support of LANs, WANs and backbone networks. Pre-installation configuring and staging. And Unisys Desktop Services, our premier enterprisewide support program.

Now that you know Network Enable is the only name you need to know, there are two things you should do: Get rid of all those other business cards. And contact us today on the Internet at <http://www.unisys.com/adv> or by calling 1-800-874-8647, ext. 134.

UNISYS

THE INFORMATION MANAGEMENT COMPANY

The *highway*
is open.
The *speed* limit
will be up
to *you*.



Communicate
with vision.



Dial calls with your voice.



Let your computer
work the phones.



Where does your business want to go?
And what do you want to do?

Want to roll out a better way to work
in over 70 countries, without leaving head-
quarters? Go to a conference, right now,
on the other side of the country? Pop up
information on your customers, the
second you take their calls?

With a little help, *you can*. AT&T
Global Business Communications
Systems can give you the communi-
cations equipment and support to do all
these things today. And we can take your
systems and make them do things you

never imagined. Because the
future is about turning what's
possible into what's *real*. Working
the way you *want* to, instead of how
you have to. Anytime, anywhere.

You can make great things happen
for your business. Starting now. Just call
AT&T at 1 800 325-7466, ext. 717.

AT&T. Where innovation leads.



Will Win 95 kill OS/2?



YES!

BY J. BRISCOE STEPHENS

R.I.P., OS/2. Your window of opportunity has closed.

If you're an OS/2 supporter, don't kid yourself. It's over. Windows 95 will nuke the OS/2 operating system in the business community.

Any pragmatic, knowledgeable, self-respecting business defining its future computing requirements today will probably choose Windows 95. Businesses know where Microsoft is headed because it has a strategic plan. These companies will *not* choose a product such as OS/2, which was developed by a company with a history of crisis management and no strategic plan.

When Version 1.0 of OS/2 debuted in the late '80s, the user community, along with IBM, hoped it would be a standard operating system that would replace Unix for PCs. It was unfortunate, of course, that this early version of OS/2 lacked drivers and application software. But surely IBM would correct these limitations.

As luck would have it, it was about this time that IBM and Microsoft parted company. In an effort to beat Microsoft's Windows NT to market, IBM launched Version 2.0 of OS/2 rather hurriedly—again, with bare-bones drivers and application software and without

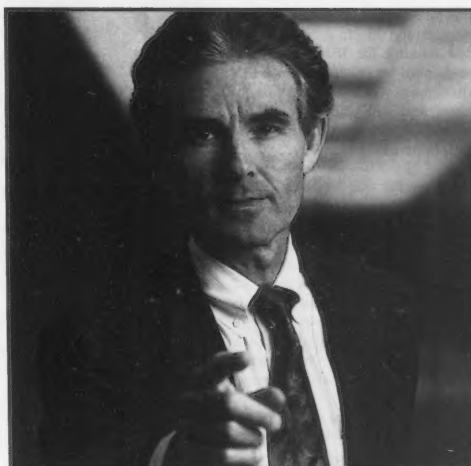
Yes!, page 98

Stephens is advanced scientific systems coordinator for the Space Science Laboratory at NASA's Marshall Space Flight Center in Huntsville, Ala. In the late 1980s, he championed the use of OS/2 in scientific computing.

Sound OFF!

AT ISSUE:

IBM says it is committed to OS/2 for the long term and has taken action to prove it. But many in the industry remain skeptical of OS/2's ability to be successful in the market against Windows 95.



NO!

BY MIKE ANZIS

The reports of OS/2's death at the hands of Win 95 have been greatly exaggerated.

Microsoft can spend its bajillions on promotion, and it will doubtless sell millions of copies of Win 95. But there are more than 6 million OS/2 installations out there, including nearly every automated teller machine, airline ticketing system, police car computer and all 904 Mazda dealers in this country.

That doesn't sound like a product that's on its way out, especially considering the widely publicized problems in Win 95's beta testing. It is said to have compatibility problems, for instance, with products such as Borland's C++ or dBase and Lotus' CC:Mail.

Not to mention that Win 95 is purported to deliver 32-bit pre-emptive multitasking when, in fact, it does not pre-empt old 16-bit Windows and DOS applications. These can still hang or crash your entire system and cause lost data and network connections.

Mazda has a number of 16-bit applications that run in their own memory space under OS/2, so if they crash or hang, they do not affect other applications.

While other organizations may have been waiting anxiously for No!, page 98

Anzis is vice president of IS at Irvine, Calif.-based Mazda Motor of America, the marketing, distribution and dealer franchising arm of Mazda Corp. in the U.S.

Will Win 95 Kill OS/2?

YES!

CONTINUED FROM PAGE 97

interoperability. Windows NT, on the other hand, featured a graphical user interface and drivers and software for most popular Windows applications.

In the spring of 1993 in Boca Raton, Fla., a group of high-end users — myself included — communicated these various crises to IBM. At the very least, we wanted interoperability with the bigger IBM RS/6000 systems.

IBM's response was "not to worry." The company assured me it was working on these problems and that OS/2 Warp would answer many of my complaints. Well, Warp does have a Windows 3.1 emulator that lets me use Windows 3.1 applications, but I am still waiting for AIX interoperability.

It was around this time, in 1994, that I started looking for IBM's long-term strategic plan for OS/2. How does IBM plan to address Win 32 applications, for instance, and will OS/2 ever run on IBM's PowerPC? To date, IBM has given me no definitive response.

Game plan?

This summer I began to wonder — was IBM's takeover of Lotus part of its crisis management response to OS/2's application problems? Was IBM afraid Lotus was going to stop supporting OS/2 applications? At the beginning of this month, at his annual session with industry analysts, IBM Chairman Louis Gerstner did not seem to know what the future of OS/2 desktop computing would hold.

Windows is a different story. In July 1992, at the launch of Windows NT in San Francisco, Microsoft laid out the long-term strategic plan it had been working on since the late '80s for Cairo — its dream operating system.

In that initial strategic plan, Microsoft showed Windows 95 as a migration path in its plans to reach Cairo. The company promised drivers, application software and interoperability. And that is just what we've been getting.

In fairness, OS/2 Warp offers speed, robustness and functionality similar to Windows 95. If only we (and most of the rest of the business world) didn't need a variety of applications to choose from and a system that can work with other platforms. If only IBM had some idea where it was going with OS/2 other than down the tubes.

But let's face facts. OS/2 is a stand-alone operating system. Call it a family of one. An application written for OS/2 will not run on IBM's bigger AIX operating system. This means a business has no way to use its OS/2 hardware and software if it needs to upgrade to more powerful systems.

Add scalability to the other missing components of OS/2 — interoperability and a strategic growth plan — and what do you get? A dying, dying, dead operating system that its chairman

does not support.

Windows 95 on the other hand, as an integral part of the Windows family, is a planned low-end migration to Cairo. Windows 95 uses basically the same application programming interfaces as Windows NT. Therefore, applications such as Office 4.3 for Windows 3.1 or Office 95 for Windows 95 run equally well on Windows 95 or Windows NT 3.51 without modification — that's what I'm now doing.

Some high-end users with legacy hardware actually prefer using Windows 95 over NT because they can use their old hardware drivers. Other users



"If only IBM had some idea where it was going with OS/2 other than down the tubes."

J. Briscoe Stephens

may need the security of Windows NT because of the sensitive data some low-end users deal with. No problem with a Windows environment — you can mix and match. It doesn't take a rocket scientist to see that mixing and matching optimizes your ability to extend the life of legacy hardware and still use state-of-the-art hardware to address future needs and requirements.

Mix and match with OS/2? Hah! Strategic plan? I challenge you to find one.

From the trade literature, it is obvious that the majority of third-party software developers see Windows as the future. Hence, popular commercial software applications will be developed as Windows 32 applications. The only major software developer to side with OS/2 has been Lotus, and just when it seemed to be questioning the sense of that, Lotus was taken captive.

For most users, Windows 95 is more gain with less pain than OS/2. Windows 95 means more productivity in the office and more fun at home.

IBM has had five years to establish OS/2 as the operating system of choice. Well, the prognosis is in.

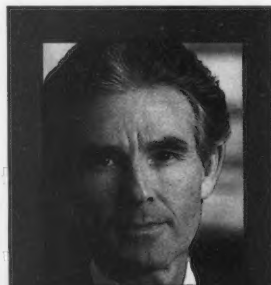
OS/2, you're dead.

NO!

CONTINUED FROM PAGE 97

the late August release of Win 95, we at Mazda have been enjoying the strategic advantage of using OS/2 for more than two years.

OS/2 runs on all 1,800 PCs in Mazda's U.S. dealerships. In addition to supporting all critical elements of the dealers' business with the company, including vehicle orders, parts orders, war-



"OS/2 is certainly secure . . . against an unproven neophyte like Win 95."

Mike Anzis

ranty claims and repair information, OS/2 supports a sophisticated image-based electronic parts catalog.

And in June, we rolled out OS/2 Warp on our field sales force's 190 laptops.

One test for Win 95 will be whether real 32-bit applications are developed for it over the next year or so. Another will be whether it provides true plug-and-play multimedia capability — which is a thrust for Mazda in the future. Those are features OS/2 and OS/2 Warp already have.

Server success

A major point for corporate users to consider is that OS/2, bundled with LAN Server 4.0, has been particularly successful as a server platform — with more than 600,000 server installations. IBM Chairman Louis Gerstner acknowledged earlier this month that OS/2's focus was on corporate users and enterprise systems. He also noted at the same time that the desktop market for OS/2 continues to grow.

Clearly, Win 95 is geared for the desktop and, perhaps, even for the kitchen tabletop. HPFS, the OS/2 file system, can support functions such as transac-

tion processing or a corporate database. We won't know until it's out whether the Win 95 file system will support anything more than balancing your home checkbook.

If you're going to compare systems at an enterprise server or networking level, then Windows NT is more comparable to OS/2 than Win 95 is. If Windows NT isn't killing OS/2 today, then Win 95 has no chance.

It is estimated that there are more than 300,000 server installations for NT today. And recently, Microsoft announced that the delivery date for Cairo, its object-oriented upgrade to NT, has slipped from 1996 to 1997.

So how these two will stack up against each other remains to be seen.

Cost prohibitive

A significant advantage for Mazda in using OS/2 has been its easy fit with our IBM SNA environment. Let's face it, much of the corporate computing world is dominated by IBM mainframe-centric architectures such as ours. Managers have to look at the relative costs of converting to Win 95. The training costs alone of converting users from OS/2 to Win 95 are estimated at several hundred dollars per user.

I want to be able to seamlessly back up my entire OS/2 LAN server DASD farm to the mainframe or install a single security system (such as IBM's RACF) across my entire architecture that allows "single log-on" control. In such a case, noncompatible options such as Windows or Windows 95 seem very unattractive.

Some suggest that IBM itself will kill OS/2. Everything IBM has said and done indicates otherwise. The company has come out with developer application programming interfaces to ease the porting of Windows applications to OS/2. It is courting top Windows developers to help them bring their applications to OS/2.

Some industry pundits suggest that IBM's acquisition of Lotus bodes ill for OS/2. However, there is at least one thing Bill Gates and Gerstner have agreed on in public statements: Notes is an application, not an operating system. Don't forget that Lotus has been the largest developer for OS/2, and IBM is not about to disrupt that. Don't forget, too, that IBM claims there are more Notes installations on OS/2 than on any other platform.

The fact of the matter is, OS/2 ain't broke, and there are lots of corporations such as Mazda that continue to rely on it. According to a recent survey from consulting firm Meta Group, Inc., OS/2 now has a 35% penetration rate in the banking industry and 28% penetration in the insurance industry.

Of course Win 95 will not kill OS/2. OS/2 addresses so much more, particularly as a server platform, than Win 95 was ever designed to address.

Yes, Win 95 may take over the den and the kitchen tabletop, but OS/2 is secure in our corporate environment and others against an unproven neophyte such as Win 95.

Attend Computerworld's New England Corporate Technical Recruiting Conference!

Monday, October 30, 1995

Boston Marriott Newton, Newton, Massachusetts

On October 30, 1995, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever New England Corporate Technical Recruiting Conference, held at the Boston Marriott Newton in Newton, Massachusetts!

A FULL SCHEDULE OF CONTEMPORARY TOPICS

7:30 a.m. - 8:00 a.m.	Continental Breakfast & Conference Registration
8:15 a.m. - 9:10 a.m.	Concurrent Sessions:
• The Internet:	How to Start Using It Personally
	The Community of People You Join
• Update on Diversity	
• Applicant Tracking	
9:15 a.m. - 12:10 p.m.	How To Pick The Right People
12:15 p.m. - 2:00 p.m.	The Top 10 Trends Affecting Information Systems Careers
2:10 p.m. - 3:05 p.m.	Repeat of Concurrent Sessions
3:20 p.m. - 5:00 p.m.	Town Hall Forum
5:00 p.m.	Program ends

CONFERENCE REGISTRATION FEE*

Before September 1, 1995 payment due by 9/15/95	\$225
September 1 - September 30, 1995 payment due by 10/1/95	\$255
October 1 - October 30, 1995 payment due by 10/30/95	\$295

* Registration fee includes continental breakfast, lunch and the complete Conference Resource Guide.

**New
England**
CORPORATE
TECHNICAL
RECRUITING
CONFERENCE

COMPUTERWORLD

For more information, call the conference hotline:

1-800-488-9204

October 30, 1995

Boston Marriott Newton, Newton, MA



HOW TO PICK THE RIGHT PEOPLE 9:15 a.m. - 12:10 p.m.

Dr. William Swan

Learn the latest in how to pick the right people from Dr. William Swan, a nationally recognized expert in interviewing and performance appraisal. Dr. Swan

conducts interview selection seminars and workshops for major corporations and government agencies and has personally trained over 25,000 managers to conduct more effective interviews.



THE TOP 10 TRENDS AFFECTING INFORMATION SYSTEMS CAREERS 12:15-2:00 p.m.

Luncheon/Keynote Address

Paul Gillin, Executive Editor, Computerworld

Sure, there are new skills entering the market every day, but what are the top 10 trends you should really keep an eye on? Paul Gillin, one of the country's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.

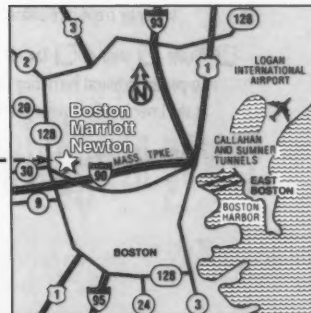
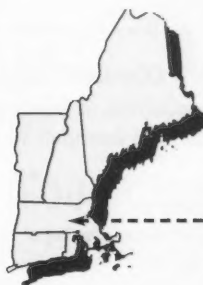


TOWN HALL FORUM 3:20 p.m. - 5:00 p.m.

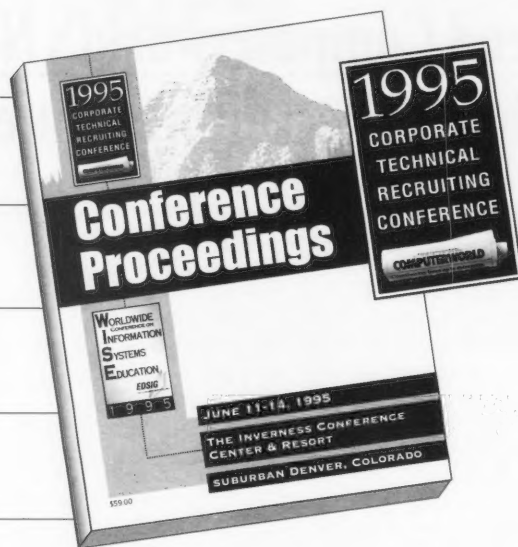
moderated by

Jack Erdlen, Strategic Outsourcing

In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as Jack Erdlen, an expert in the HR field, leads us through this modern discussion of your recruiting topics.



Learn Technical Recruiting from the Experts!



If you recruit Information Systems talent and want to get expert advice, you'll want to order the complete proceedings from Computerworld's 1995 Corporate Technical Recruiting Conference, held June 11-14 in suburban Denver. For just \$59 plus \$3.50 for shipping and handling, you'll receive this 220-page book that's packed with over 40 presented papers on subjects including candidate selection, sourcing techniques, diversity, college relations, immigration, and much more. And all papers are written by experts, so you're sure to learn from top presenters in the field.

To order your copy, simply fax or send the coupon below. But hurry, because supplies of this one-of-a-kind tool are limited!

To order, fax this coupon to: 1-508-620-9430

Or send to: Computerworld, c/o Price Lampert Associates,
187 Oaks Road, Framingham, MA 01701

To
REGISTER
for the 1996 conference
or to
ORDER
the 1995 proceedings
call
1-800-488-9204
or use this coupon
today!

- ☐ Please rush me the 1995 Conference Proceedings
☐ I've enclosed my check for \$59 + \$3.50 for shipping & handling, or
to pay by credit card please call 1-800-488-9204.
- ☐ Please ☐ send or ☐ fax me information about the 1996
Corporate Technical Recruiting Conference to be held June 2-5, 1996
at the Inverness Conference Center and Resort, suburban Denver, CO.
- ☐ Please register me.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
PHONE _____ FAX _____

Your career is knowledge.

<http://careers.computerworld.com>

POWER

YOUR POWER IS YOUR CAREER.

<http://careers.computerworld.com>

Your knowledge is power.

Your power is your career.

YOUR CAREER IS KNOWLEDGE.

POWER

Your knowledge is power.



"From some 600 responses generated by a recent Computerworld recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement."

*Jason K. Whitehair
Recruiting Manager/Systems Engineering
MCI Telecommunications Corporation*

Having just celebrated its 25th anniversary and exceeding \$10.6 billion in revenue, MCI is not only the nation's second largest long-distance provider, but also the world's fifth largest carrier of international traffic. Because the Systems Engineering Division plays a strategic role in shaping MCI's technological future, Recruiting Manager Jason Whitehair relies heavily on *Computerworld* to help recruit leading-edge professionals.

"Dedicated to delivering premier customer service and the highest quality products, Systems Engineering provides systems and software development and support to all of MCI's domestic and international voice and data businesses. Everything from message processing and commercial billing ... to network management and control ... to MCI Mail ... and more. Take our Friends & Family program, for example. Our software applications are what keep track of millions of 'calling circles' and generate customized bills.

"Not limited to any one platform, we utilize the platform best suited to deliver each customer service. So I'm always looking to recruit systems engineers with at least five to seven years of experience in a wide range of technical environments. Because *Computerworld* is one of the best trade publications for staying on technology's leading edge, its readers are the professionals we're generally looking to recruit. When it comes to recruitment advertising, *Computerworld* delivers a much higher ratio of qualified candidates than daily newspapers or nontechnical publications.

"The vast majority of resumes generated by our *Computerworld* recruitment advertise-

ments are from very high calibre candidates. We're typically able to use 350 out of every 400 resumes we receive -- and that's a hit rate of nearly 90%. In fact, from some 600 responses generated by a recent *Computerworld* recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement. For a single advertising investment, we've more than gotten our money's worth.

"After Systems Engineering moved from Washington, D.C. to Colorado Springs back in 1991, our *Computerworld* recruitment advertising has been instrumental in helping us hire more engineers than usual -- and hire them fast. And, since I'm still seeing activity as a result of a recruitment advertisement we ran five months ago, I know we get sustainable impact with *Computerworld*.

"As MCI continues to expand into the long distance market including data transmission, 800 service, international calling, and Personal Communications Services (PCS), we'll continue to rely on *Computerworld* recruitment advertising to attract the hard-to-find, highly qualified technical people our global business demands."

Computerworld. We're helping Information Systems employers and qualified Information Systems professionals get together every week. Just ask MCI's Jason Whitehair.

To put *Computerworld* to work for your hiring effort, call John Corrigan, Vice President, at 1-800-343-6474. And place your hiring message where the qualified candidates look. Every week.

COMPUTERWORLD

Where the qualified candidates look. Every week.

1 800 343-6474
in MA 508 879-0700

Computer Careers

Catch the Wave: Surf's Up for IS Contracting

By Leslie Goff

Demand for information systems contractors is swelling, driven by the ever-cresting wave of client/server application migration and development. The opportunities are gnarly, you might say.

"It's their market," says Joan Berenato, director of recruiting at Devon Consulting in Wayne, Pa., a regional consulting firm. "We can't find enough people for positions, and that's nationwide."

At this point, just about everyone is benefiting from the glut of work. For example, at The Registry, an 8-year-old consulting firm in Newton, Mass., sales for its fiscal 1995, which just ended, were \$95 million — an increase of 58% over last year. "Picking out the hottest specialty, or even region, is really hard because demand is up across the board," says Michael Foley, regional recruiting manager for the Northeast.

So how can you cash in as an independent or subcontractor? Experts tell us what's in demand and where.

Hot positions

- Visual Basic, PowerBuilder, C++ programmers
- Unix systems administrators
- LAN, WAN administrators
- Oracle, Sybase database administrators and application developers
- Mainframe maintenance programmers, application developers
- Notes application developers
- Internet specialists/Web masters
- Systems integrators

Sources: Devon Consulting, Wayne, Pa.; Computer People, Inc., Los Angeles; Independent Computer Consultants Association (ICCA), St. Louis; National Association of Computer Consultant Businesses (NACCB), Greensboro, N.C.; Professional and Technical Consultants Association, Mountain View, Calif.; The Registry, Newton, Mass.

Hot regions

"Demand is strongest in the Northeast and Southeast. In those two areas in particular, we're seeing a convergence of demand for legacy skills and, not as surprising, skills in newer technologies. In other regions, the demand seems to be for one or the other."

—Tony Vickers, president and chief executive officer, Computer People; 10 U.S. offices employ 600 full-time IS professionals

"We opened our first office in the San Francisco Bay area just a few months ago, and it has been one of the fastest-growing offices in our company's history."

—Michael Foley, regional recruiting manager, Northeast, The Registry; 22 offices employ 1,200 contractors

ager, Northeast, The Registry; 22 offices employ 1,200 contractors

"We're seeing more and more demand for HP-UX systems administrators, at least in this particular area. Also, the Sun Solaris Unix operating system market is heating up."

—Joan Berenato, director of recruiting, Devon Consulting; has 200 contractors

Hot industries

The consensus is that telecommunications and financial services/banking are the busiest sectors to target. Certain regions are noted for their concentration of companies in a single industry. The South New Jersey/Pennsylvania region, for example, has a high concentration of pharmaceutical firms; the San Francisco area has software developers and hardware manufacturers; Southern California has defense and aerospace; the East has telecommunications, financial services and publishing.

Sources: Devon Consulting, Computer People, ICCA, NACCB, The Registry

Where the wave will peak next

"The hottest area for contractors in the next few years will be security because of the Internet. Security in departmental systems is pretty lax, but when we start making financial transactions a reality on the 'net, the market for security specialists will go crazy."

—Ray Rauth, consultant, chairman of the board, ICCA

"We're expecting Windows 95 to generate strong demand from clients who need help evaluating the merits of migrating and to assist with the actual migration. We're planning to hire new people for a new service we're designing around that need."

—Tony Vickers, Computer People

Advice from those who have been there

"Have your first client already lined up when you hang out your shingle."

—Ray Rauth, ICCA

"If you're just starting out, ask recruiters in your area who their major clients are and try to get a historical sense of what clients have been looking for. What have they done in the past, where are they now, and what's coming? Good recruiters will track this so they can accumulate the experience they need on board in a proactive, timely way."

—Joan Berenato, Devon Consulting

Resources

Independent Computer Consultants Association
St. Louis, Mo.

(314) 892-1675

Provides job listings via CompuServe.
Type: Go Consult.

National Association of Computer Consultant Businesses
Greensboro, N.C.
(800) 313-1920

Professional and Technical Consultants Association
Mountain View, Calif.

Kent Safford, membership director
(415) 903-8305

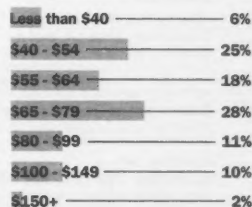
A nonprofit group that provides job referrals and other member services for software engineers and other technical consultants (<http://www.patca.org/patca>).

Goff is a freelance writer in New York.

IS consultants

Average hourly rates

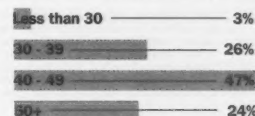
Base: 462 respondents



Source: Independent Computer Consultants Association (ICCA) 1995 Member Survey, St. Louis

Average age

Base: 462 respondents

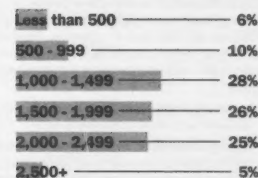


Source: ICCA 1995 Member Survey

Average hours billed

IS employees work an average of 2,000 hours each year. Full-time contractors bill the following annually:

Base: 174 respondents



Source: Professional and Technical Consultants Association (PATCA) 1995 Consulting Rates and Business Practices Survey, Mountain View, Calif.

NOTE: Responses were for the prior 12 months. Although membership is national, PATCA's members are largely based in Northern California and work primarily in hardware manufacturing and software development industries.

Computer Careers

The UNISYS OUTSOURCING PRACTICE, headquartered in McLean, Virginia, is continuing to build its core team in client business development, service delivery, technical and program management. We seek individuals with commercial, financial and public sector experience in systems transition, systems management and maintenance, and tailored solutions to complex information management challenges.

In 1994 we awarded 22 new client engagements in outsourcing, won 3 contract extensions and 6 new disaster recovery contracts. Included in those 1994 awards were clients such as Mitsui, NYNEX and Andersen Windows—and our 1994 revenues grew more than 50% over 1993.

Unisys A-Series & 2200 • Positions Nationwide

•Atlanta, GA•

Senior Systems Specialists, A-Series

Data communications and networking experience including COMS, BNA, CP2000S, A-Series TCP/IP, and 3rd-party equipment.

•Boston, MA•

A-Series Operations Manager

Multiple A-Series installations in a 5-state, networking environment—BNA. Excellent people management skills and 8-10 years experience required for this multi-site, 24 hours/day operation.

•Birmingham, AL•

Principal Systems Support Analysts

Multi Data Center environment. Experience must include 2200, U6000, PCs and U5000. Technical direction to help desk and support staff also required.

Systems Support Analysts

Experience in 2200/500S, U6000, PC consoles and U5000s. SPO administration.

•Cherry Hill, NJ•

Director, Data Center

Manage service deliverables for commercial clients and maintain high levels of performance and client satisfaction in a growing, dynamic environment. Large data center management and strong technical skills required, including telecommunications. 2200 and UNIX platforms.

Telecommunications Analysts & Systems Analysts
Monitor networks, PC/LAN/WAN; TELCON, CMS, DCP, TIP, CIS; 2200 and UNIX installed systems.

•Lansing, MI•

A-Series Operations Staff

Large A-Series application and network transitions require technical managers, senior design analysts, programmer analysts, technical writers and computer operators.

•McLean, VA•

Business Analyst, A-Series & 2200

Unisys A-Series and/or 2200 hardware/software experience; proposal support, client briefings, and 3rd-party configurations.

•New York/New Jersey•

A-Series Operations Staff

Large A-Series application and network transitions require technical managers, senior design analysts, programmer analysts, and computer operators.

Join a company that values quality, service and solutions. UNISYS offers the competitive compensation/benefits, challenging engagements & significant career growth that you would expect from a leader. Qualified candidates should forward resume with salary history, indicating position of interest, to: Unisys Outsourcing Practice, 8008 Westpark Drive-NH4A, Attn: Bill Gunn-Dept. CW0828, McLean, VA 22102. FAX: 703-847-2522. We are an equal opportunity/affirmative action employer committed to work force diversity.

UNISYS

DIRECTOR INFORMATION SYSTEMS, COMMUNICATIONS AND NETWORKS

Baptist Memorial Health Care Systems, one of the largest and most outstanding healthcare systems in the country, has an excellent opportunity for a Director of Information Systems. Responsibilities include planning and directing all facets of communication and network operations to successfully advance the implementation of our integrated delivery system. Qualifications include:

- 5+ years progressive leadership roles in a fast paced work environment. Healthcare preferred.
- Strong background evaluating and implementing sophisticated communication networks including data, voice and video for a diverse multi-entity organization. LAN/WAN experience.
- Proven ability to successfully manage multiple projects and facilitate I/S strategies/solutions through outcome oriented leadership.

If you are interested in joining a dynamic team, please submit resume and salary requirements to:

BAPTIST MEMORIAL HEALTH CARE SYSTEM

1750 Madison Avenue - Suite 100
Memphis, Tennessee 38104

Phone: (901) 725-2890 • Fax: (901) 725-2889

EOE

M/F/H

BUSINESS ANALYST

Customized Transportation, Inc., a unit of CSX Corporation and a leader in providing supply chain management services to domestic and international businesses, is currently looking for an individual to join its Technology team in Greer, SC.

We are looking for a highly motivated individual with well developed project management and communication skills for CTI's logistics services contract with a major automotive assembly plant. The position will work closely with the Jacksonville, FL based CTI Technology team to provide a broad range of systems development and support activities. The successful candidate will have demonstrable AS400/RPGIII experience; experience with MRP, warehousing and/or transportation systems will be a plus.

CTI offers an attractive salary and a fully paid benefits program. If you have the required skills and are interested in joining a dynamic team environment in an exciting, rapidly growing and fast-paced organization, please send your resume to: CUSTOMIZED TRANSPORTATION, INC., Attn: SAD, P.O. Box 40083, Jacksonville, FL 32203. Equal Opportunity Employer.

CTI
CUSTOMIZED TRANSPORTATION INC.

Computer

ORACLE DATABASE ADMINISTRATOR

Do you want to:

Get in on the ground floor with a growing company?

Work with the latest technology?

Make your own technical decisions?

Be the lead on database issues?

Then the United States Enrichment Corporation (USEC) is the place for you. USEC is the world's largest supplier of uranium enrichment services to electric utilities that own and operate nuclear power plants. With a newly formed corporate headquarters in Bethesda, MD (Washington, D.C. metropolitan area), and \$1.4 billion in sales, USEC is seeking a DBA to manage and administer the ORACLE 7 RDBMS. Working with the latest technology in hardware and software, you will be instrumental in implementing and working with PeopleSoft, ORACLE Order Management Systems, and ORACLE Financials.

Strong experience with ORACLE 7 is required, as well as 5-7 years experience with RDBMS. Experience with any of the above applications is a real plus, as well as experience with SUN Solaris OS. College degree or equivalent is required.

USEC offers a competitive salary/ benefits package, and an excellent work environment. For consideration, send your resume to: United States Enrichment Corporation, 6903 Rockledge Drive/DBA, Bethesda, MD 20817, FAX: (301) 564-3203, Internet: jobs@usec.com EOE M/F/D/V.

USEC
United States
Enrichment Corporation

KNAUER CONSULTING

Greater San Francisco Bay Area

Contract Opportunities

- Powerbuilder, Oracle
 - Cobol II, CICS, DB2
 - Visual Basic, Access,
 - or SQL Server
 - Win NT/Application Integration
 - Oracle & Sybase
 - Nomad
 - Unix/Lan/Wan System Admin.
 - SAP
- 1-800-562-8371 fax (415) 434-8427
Knauer@dice.com

Software Professionals

- Oracle/Sybase/Unix
- Oracle Financial/Oracle
- MFG/Oracle Case
- Visual Basic/C
- OS/2, C
- Unix Internals, C
- Lotus Notes
- Powerbuilder/Oracle

Immediate Openings Call

INFOSTYS

1-800-941-1491

FAX 516-499-2469

INTERNET E-MAIL

INFOSTYS@SONO.COM

CONSULTANTS SHOULD CONSULT

MIMI

IMMEDIATE CONTRACTS

Please send resume & call

Mimi Simon Assoc.

10 West St., Suite 1105, NYC 10006

(212) 406-1705

FAX (212) 406-1768

CONSULTANTS

- All Technologies
 - Nationwide Openings
 - Salaried or Project Basis
 - 2+ Years Experience
- Send/Fax resume to:
Analysts International Corp.
P.O. Box 39612
Minneapolis, MN 55439
Fax (612) 897-4693

Programmer/Analyst

(Orlando FL client sites).

Analyze requirements,

design, develop, code, test,

implement and maintain

financial applications using

RPG/400 in an IBM AS/400

environment. Bachelor's

Degree in Engineering,

Comp. Sci., or Math + 2 yrs.

exp. in job req. \$37,500/yr.

40 hr/wk; 8:30 a.m.-5 p.m.

Send resume to: Job

Service of Florida, 1001

Executive Center Drive,

Orlando, FL 32803-3520.

Re: Job Order No. FL-

1294098.

We are currently recruiting for permanent and contract positions in the following areas:

MFG/PRO MANMAN
SAP MANMAN
BRICS PROGRESS
ORACLE FORTRAN
UNIX POWERBUILDER
HP/DEC/AS400

Please fax your resumes to
(703) 473-2551 or mail to:

Hyper Gen

P.O. Box 677

Fincastle, VA 24090

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

For over

two decades,

Computerworld

has delivered

qualified job

candidates to

America's

employers.

And ever since
Computerworld's
first weekly issue in
1967, America's
companies have relied
on Computerworld
to target America's
most qualified computer
job candidates.

To place your advertisement regionally or nationally, call John Corrigan, Vice President/Professional Development Division, at 1-800-343-6474; x8201 (in MA, 508/879-0700).

COMPUTERWORLD
Recruitment Advertising Division

Consultant

COMPUTERWORLD

CAREER GROWTH OPPORTUNITIES

with a Pittsburgh consulting firm specializing in the
ORACLE RDBMS

We are looking for highly motivated, dedicated people with good interpersonal, writing, and communication skills and 2+ years of ORACLE experience.

- ▲ ORACLE Applications ▲ ORACLE DBAs
▲ PeopleSoft Applications ▲ Developers
▲ Systems Analysts ▲ Project Leader

We are a growing firm that provides attractive compensation, benefits, and bonus plans. We are committed to the training and long-term growth of our staff. Contact:



40 East Mall Plaza, Suite 202, Carnegie, PA 15106
Fax: (412) 279-8001

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. *Computerworld's* audience of over one half million is made up of the right people in every major industry.

INDUSTRY**COMPUTERWORLD'S
AUDIENCE****Information Systems "vendor" companies
(includes consulting)****165,037****Computer Manufacturer****67,894**

large-scale systems

36,446

mid-range systems

49,590

PCs/workstations

53,379

Software Vendor**100,012**

large-scale systems

44,865

mid-range systems

82,722

PCs/workstations

61,517

Non-CPU Computer products manufacturer**24,401****VAR/Dealer/Retailer****22,685**

DP service bureau/contract DP services

42,231

Consulting/Planning

75,019

**Information Systems "user"
companies and organizations****475,301****Manufacturing (not computers)****126,464****Insurance****69,501****Healthcare****76,548****Banking/Financial Services****83,985****Government Federal/State/Local****144,312****Business Service (except DP)****27,035****Communications Systems****31,729****Public Utilities****39,424****Transportation****6,735****Wholesale/Retail Trade****123,785****Education****70,764**

SOURCE: Skill Survey of Computerworld's Audience, August 1994.

To place your advertisement regionally or nationally, call John Corrigan, Vice President/Professional Development Division at

800/343-6474 x8201, in MA 508/879-0700.

COMPUTERWORLD

Where the qualified candidates look. Every week.

SOFTWARE ENGINEER. To design, develop, enhance and maintain software products on AS400 system using RPG400, COBOL400, CL/400, SQL400, SEQUEL 05/400 database and different utilities (SEU, SDA, RLU, PDM, DBU, EZVIEW, PATHFINDER, DEBUG, SORT, DDM, PC-SUPPORT, Officevision400) and develop custom software packages for manufacturing, retailing, distribution, warehousing, telecom industry in an environment like MAPICS, JDA, HFA, DPI, EDL. Bachelor's in Computer Science, Engineering, or Math-related and two years experience in job offered or in design and development of customized software. \$47,500/year. Interested applicants apply in person or by resume to Georgia Department of Labor, Job Order #GA 5890787, 2943 N. Druid Hills Road, Atlanta, Georgia 30329-3909 or the nearest Department of Labor Field Service Office.

SYSTEMS ANALYST. Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer systems. Two years experience with ORACLE, SQL, X-Windows, TCP/IP, MCTIF on UNIX machines required. Bachelor's in Computer Science, Engineering, or math-related plus two years experience in job offered or in design and development of customized software required. \$39,000/year. Interested applicants apply in person or by resume to Georgia Department of Labor, Job Order #GA 5888745, 2943 N. Druid Hills Road, Atlanta, Georgia 30329-3909 or the nearest Department of Labor Field Service Office.

Computer Engineer: Responsible for hardware & software installations in Latin America; supervise 2 separate divisions. Responsible for support of the Sales Dept. in several countries in Latin America & Caribbean. Prepare, modify & implement Marketing & Sales Plans & develop & design strategies geared toward the unique financial sector of each country; responsible for training personnel & providing customized services. Direct the execution of company's formulated Business Development Plans & assist in the development, execution & installation of financial sophisticated software designed specifically for potential & existing clients. Develop & supervise the terms & conditions for acceptance of projects by clients in the several countries. Supervise various projects in each country during & after the installation of software. Evaluate the possibilities of modifications to clients' contracted software & develop & implement the necessary personnel training. Totally responsible for client support & adjust predesigned software to actual client operations. Develop & execute maintenance plans for installed software, & maintain up to date levels of efficiency. Formulate & implement departmental budgets consistent with company's financial goals & constraints. Supervise 15-16 employees. B.S. in Computer Science/Information Systems or equivalent and 5 yrs exp in job offered or as Systems Analyst. Must have knowledge of Latin American financial institutions and experience with IBM or IBM compatible hardware and software. Must be fluent in Spanish. Extensive overseas traveling required. M-F, 9-5, \$50,000. Send resume only to: Job Service of Florida, 701 S.W. 27th Avenue, Room 47, Miami, Florida 33135-3014 Ref: Job Order FL-1282944.

This Space For Hire

Call today to place your recruitment advertisement.
800-343-6474
ext. 201,
(in MA,
508/879-0700)

ATLANTA HOUSING AUTHORITY

*This Isn't Just Another Job...
...it's a real challenge, real change, real rewards.*

IMS TRAINING COORDINATOR

The Atlanta Housing Authority, a major provider of affordable housing in the Southeast, is seeking a degreed individual (B.S. Computer Science or related field) to provide IMS training. The position requires 2 or more years of experience providing information technology training to end users including application system and microcomputer hardware utilization (terminals, PCs, printers, etc.), application software executing on host or server computers, and general PC software (word processing, spreadsheets, graphics, desktop publishing and forms design). Experience in supporting, analyzing and responding to Help Desk requests and inquiries is also required. Excellent communication and organization skills are essential for this position.

The successful candidate will have the proven ability to take a high level of responsibility for analyzing, recommending, developing and delivering computer automation and technical training to employees Authority-wide. The position requires the ability to work independently or within a team environment to establish and maintain ongoing training and technical support to end users. We offer a competitive salary and benefits including health, dental, life and disability insurance coverage as well as retirement.

If you are self-motivated and results-oriented with proven training skills, please forward your resume by September 15, 1995 to:

Senior H.R. Representative
Atlanta Housing Authority
739 W. Peachtree Street N.E.
Atlanta, Georgia 30365

EOE M/F/D/V

The Atlanta Housing Authority supports a drug-free work environment

Senior Computer Science Engineer. (Five openings available). Requires master's degree in computer science, electrical engineering or math, & one year's experience in software design in UNIX environment, using interprocess communications & multitasking. Experience must include preparation of computer software specifications & coding, testing & documentation of software utilizing C, Motif, X/Windows, & embedded SQL. In lieu of master's degree & one year's experience, will also accept bachelor's degree in stated field of study & three years' stated experience. Design code, test & document software, utilizing interprocess communications & multitasking tools, in UNIX environment. Gather technical information & prepare computer software specifications using Specification Control Document according to ISO 9000 procedures & specific word processor packages. Code, test & document software modules for pay-per-view maintenance, billing interface processing, HEC transaction processing & report generation, utilizing C, Motif, X/Windows, & embedded SQL. Connect cable systems equipment to controller. Develop software modules involving relational database & graphical user interface applications. 40 hrs/wk. 8:00-5:00. Sal. range: \$47,267-\$53,000/yr. dep. on educ. & exper. Apply in person or send resume to the Georgia Dept. of Labor, Job Order #GA5866706, 1535 Atkinson Road, Marietta, Georgia 30067-5601 or the nearest Department of Labor Field Service office.

ATTENTION
All Unix Based Developers!

The New Technology and Systems Development group of a major Electronic News Distribution service company is seeking to fill four open positions in a newly created Research and Development group. The group will be responsible for the designing, and developing of new systems and services for the company from the ground up. The primary implementation technology includes: C, Unix (SunOS, Solaris, Interix, Ultrix), RPC based systems with FAX, IR, T-1, and T-3 interfaces. The following positions are:

- 1) Senior Unix X/Window Distributed Developer
- 2) Senior Unix Networking Distributed Developer
- 3) Junior Unix RPC, RDBMS developer interested in advancement towards expert status at networking and/or X/Windows.
- 4) Windows NT Accounting system developer

X/Windows - Senior System Developer

Must possess a strong hands on background in C, Unix, Solaris, X/View 3.1 with Devguide, Xlib, OpenLook, Motif, TCP/IP, RPC, Toolkit, Sysbase.

Networking - Senior System Developer

Solid hands on experience in C, Unix, Solaris, TCP/IP, RPC, sockets, telecommunications or FAX related background.

Junior Unix Developer (1-4 yrs)

Hands on Experience in C, Unix, TCP/IP, RPC, sockets, Sysbase.

Windows NT Developer

Will be developing and maintaining new client/server accounting system software. BS in computer science or equivalent experience. Minimum 5 years experience in Visual Basic and/or C programming. At least 1 year experience with Windows NT. Ability to configure, install PC software. Experience with Sysbase or Microsoft SQL Server. Must have the ability to work with others in a group project environment. Excellent verbal communications skills are a must. Must be prepared to work independently. Be prepared for extensive hands on testing. Six months technical probation period mandatory. Excellent benefits and compensation plan. All resumes should be directed to: CW-158276, Computerworld, Box 9171, Framingham, MA 01701-9171, or fax to 508-620-7739 referencing CW-158276.

MANAGEMENT INFORMATION
SYSTEMS DIRECTOR

Albany, GA \$40,560 to \$49,441 DOQ

Supervises the MIS Department. Requires extensive knowledge of computers and communications commensurate with that found by possessing a Masters Degree in related fields and five years of experience or equivalent. For application call 912-431-2877. The hearing impaired only may call TDD 1-800-255-0056. EOE/AA/M/F/D. Georgia Open Records Act applies. OPEN UNTIL FILLED.

FLORIDA

OPPORTUNITIES FOR
IT PROFESSIONALS WITH:

- IDMS/ADSO
- TPMS EXPERT
- MF COBOL/UNIX/MVS
- COBOL/DB2/CICS/DCS
- BORLAND & VISUAL C++
- COBOL/IMVS, IMS/DB2C
- MS ACCESS/++ORACLE
- TANDEM/COBOL/SCOBOL
- ORACLE DBA'S
- IMS, DB2, IDMS DBA'S
- UNIX SYSTEM ADMIN/HP-UX
- INFORMIX DBA/4GL/ESQLC
- PEOPLESOFT/HR/FINANCIALS
- C & C++/UNIX/MOTIF/UNIXSQL
- INTERGRAPH/MOL/CAX/UNIX
- ORACLE FINANCIALS/REPORTS

FOR IMMEDIATE CONSIDERATION CALL OR FAX RESUME TODAY

Syslogix

(800) 797-5644 P.O. Box 26146 FAX
(813) 287-0054 Tampa, FL 33623 (813) 282-9511

Join Our Team of
Winning Oracle &
PowerBuilder
Developers and
Work with Telcom's
Premier Provider of
Enhanced Service
Platforms.

Open Development
Corporation is the premier
provider of Enhanced Service
Platforms.

We develop and market openMedia™, a software-based Enhanced Service Platform that supports high volume telecommunications applications. We are growing at a clip of 300% this year ... so get on the fast track with us today!

Don't Miss This Opportunity!

14 Southwest Park
Westwood, MA 02090
Attn: Marketing Manager

*In less than three years, we've hooked some of the
biggest names in the Telecommunications industry.*

*Today, we are recognized as the leader for our
Enhanced Service Platform because we consistently
implement leading-edge technology.*

*Telcom is HOT right now. Quit that boring job and
join our successful, exciting team of Oracle and
PowerBuilder Developers.*

**The Competition...
Is Under Our Thumb**

openMedia™ is the most
comprehensive, most robust
Enhanced Service Platform
available today.

openMedia™ is a pure, open client-server platform that was built from the ground up using standard "best of breed" hardware and software. At the heart of openMedia™ is a tightly integrated Oracle database that offers the reliability and performance required to deliver high volume enhanced service platforms.

Become a member of the hottest
development company in the
telecommunications industry.

The advent of Enhanced Service Platforms has forever changed phone service as we know it today. The applications for our core technology keep expanding due to customer demand. Join this exciting industry and our fast growing company now!

Call or Fax Us Today!

Fax: 617-251-9144
Ph: 617-251-3000

o p e n
c o r p o r a t i o n

MIS
PROFESSIONALS

Westinghouse Electric Corporation, a Pittsburgh, PA-based Fortune 200 company, is launching a technologically challenging project to design and install its global network.

The first three positions require proven project management experience and at least five years experience with multi-platform LAN and Desktop environments. B.S. degree in Computer Science or related field of study is required.

NETWORK SYSTEMS ENGINEERS-Must possess strong network design and engineering skills on TCP/IP, DNS, DHCP, Windows NT (WINS), Cisco routers (IGRP/OSPF), Cabletron hubs, 10baseT ethernet, FDDI, Frame Relay, X25, ISDN and SLIP/PPP. Experience on technologies such as SNA and DECnet also considered. Cisco, Cabletron and Microsoft certifications desirable.

NETWORK OPERATING AND DESKTOP ENGINEERS-Seeking network operating skills in Microsoft NT, Windows or Workgroups, Windows 3.1, NT Desktop, TCP/IP, and DHCP. Strong Novell, Banyan or IBM LAN/Server experience will be considered. NT, Novell or other certifications desirable.

TECHNOLOGY INSTALLATION PLANNER-Develop detailed plans for data and application migration, and desktop computer and LAN/WAN installations.

The two positions below require a B.S. in Math, Computer Science or Engineering, with five years of development and team-oriented experience.

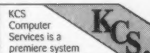
NETWORK & SYSTEM MANAGEMENT PROGRAMMER/ANALYSTS-Seeking experience in distributed LAN/WAN environments and network tools (i.e., Netview AIX or OpenView). Skills should include: ethernet, IP protocol, UNIX or AIX, C/C++, Windows NT or Novell LAN administration, and Microsoft Systems Management Server (SMS).

INFORMATION SYSTEMS SOFTWARE ENGINEERS-Seeking experience in distributed client-server technology. Skills should include: C/C++ +, NT, NT/AS and AIX operating environments, Visual Basic, Trouble Ticket for AIX, Direct Talk Voice Response Unit, and DB2/6000, Oracle, and SQL/Server DBMS.

We offer salary commensurate with background and experience along with a comprehensive benefits program. Interested candidates, please specify desired position(s) and send resume and salary requirements, to: Westinghouse Electric Corporation, 11 Stanwix Street, Room 1408, Pittsburgh, PA 15222-1384, Fax (412) 642-8068.

Westinghouse

An Equal Opportunity Employer



KCS Computer Services is a premiere system integration, training, and custom software development organization. KCS is seeking Systems and Data Architects, Analysts, Programmers, and Communications Experts in Mainframe and Client/Server environments. In addition, KCS seeks industry experts in Banking, Healthcare, Manufacturing, and technical experts in Multimedia and Microsoft. The following are typical skills required:

- UNIX/OS2/NT/NOVELL
- ORACLE/INFORMIX/INGRES/STRADE/SAP
- VISUAL BASIC/VISUAL C++
- POWERBUILDER/C++
- C/MICROFOCUS COBOL
- COBOL/CICS/NATURAL
- IMS/DB2

KCS has offices in Pittsburgh, Philadelphia, Atlanta, Phoenix, Cleveland, and San Francisco.

KCS Computer Services, Inc.
777 Penn Center Blvd., Suite
600, Attn: CWS, Pittsburgh, PA
15235-5906
Phone (412) 823-8632
Fax (412) 823-8821

Computer Careers

IN BUSINESS, YOU GET BETTER RETURNS WHEN YOU INVEST IN THE RIGHT PLACES.



At Perot Systems, we invest in our people first. Because in our business, the business of ideas, the inventory walks out the door every night - with those people. We became one of the world's fastest growing information technology services companies by attracting, developing and recognizing outstanding people.

If this sounds right to you, consider the following opportunities, many of which are available in Atlanta, Dallas, Detroit, Denver, Colorado Springs (relocation assistance available), Northern Virginia, Minneapolis, Tulsa, and Mechanicsburg, PA.

- Client Server Programmers
- Mainframe Programmers
- Business Analysts
- Software Quality Assurance Testers
- Database Administrators
- LAN Administrators
- Network Analysts
- Project Managers
- Business Process Reengineers

So if you're looking for the right place to invest in your career, consider Perot Systems. We offer a competitive compensation package that includes an innovative individual and team-based incentive plan. To learn more about Perot Systems, including career opportunities throughout the country, visit us on the World Wide Web at www.ps.net or call our Job Line at 1-800-60-PEROT. Resumes should be sent to Attn: Dept. CW 8/28. FAX: (703) 648-2476. E-mail: recruiting@ps.net Mail: Perot Systems Corporation, 1801 Robert Fulton Dr., Suite 200, Reston, VA 22091. Equal Opportunity Employer.

PEROT SYSTEMS CORPORATION



CLIENT/SERVER OPPORTUNITIES

Need more than just a job? We're looking for career-minded people.

Put your ability to create client/server solutions to work at Compuware. There are exciting career opportunities for professionals with experience in the following technologies:

- **Compuware UNIFACE**
 - **UNIX with strong relational database & networking skills**
- Relocation is not necessary for these positions, but the ability and desire to travel extensively throughout North America is required. Call or fax your resume referencing code CW10 to 800-997-2797, fax 800-871-0401.

Our Milwaukee Professional Services Group has opportunities for programmers with **C++ and Windows technologies**. Call or fax your resume referencing code CW11 to Dan Parnen at 414-225-4000, fax 414-225-4011.

Compuware Corporation is a twenty-two-year leader in bringing enterprise-wide software and services to the world's largest users of information technology. Join Compuware, creator of such widely used products as UNIFACE, EcoTOOLS, XPEDITER, Abend-AID, File-AID and more.



COMPUWARE
An Equal Opportunity Employer

CONSULTANTS

We are Oracle, Applications, and Client Server specialists, also serving our clients other DB requirements.

★ Oracle ★ Oracle Financials ★ PeopleSoft ★ PowerBuilder
★ Informix ★ Sybase ★ Unix ★ DOS/NT ★ CICS ★ COBOL

★ Contract and permanent positions
★ Top salaries & benefits ★ Full disclosure of contract rates
★ Technically trained recruiting staff



Miami, FL: 305 592 9990 fax: 305 592 9974 (East Coast)
Owensboro, KY: 517 723 9501 fax: 517 725 6383 (Mid West)
Portland, OR: 503 248 0820 fax: 503 248 0821 (West Coast) 09/07

EDP Contract Services

has multiple openings in SouthEast CT for 1 yr.+ assignments.

**IMS - COBOL
DB2 - FORTRAN**

Fax resumes to:

EDP Contract Services
30 Waterside Drive, Farmington, CT 06032
(203) 674-1771 • (203) 677-9030 fax

DEFENSE FINANCE AND ACCOUNTING SERVICE

is accepting applications from all qualified applicants for the position of Assistant Deputy Director for Information Management, ES-334, (General). Anne No.: SES-06-95, Defense Finance and Accounting Services, Arlington, Virginia, \$97,991 to \$122,040 per year. To obtain application procedures call (703) 607-2542 (application deadline is must be post marked by September 13, 1995).

MTW CONSULTING Making Technology Work IE/IEF/TELON

MTW Consulting is hiring for project work! With several multi-year, full life cycle projects under way, MTW Consulting has immediate needs within several key positions including:

- Senior and Mid-level IE/IEF Developers
- Experienced Telon/DB2/CICS Programmer Analysts

MTW Consulting offers competitive salaries, relocation assistance and an excellent benefits package.

Respond to:
2300 Main St., #900, Kansas City, MO 64108
(816) 421-5005 • (800) 669-9MTW
Fax (816) 471-7918

ATTENTION CONTRACTORS!

Add your resume to the Jupiter Database and let all the consulting companies that are looking for your skillset come to you. Assignments/Positions are available nationwide for absolutely all skillsets. The Jupiter System, an on-line database of IS professionals that are available for contract and/or permanent positions, can give you the added advantage in finding that perfect assignment or job. And it costs you nothing! If you want that added advantage, mail or fax your resume to:

The Jupiter System

P.O. Box 37075 FAX (800) 505-6293
Kansas City, Mo. 64138 VOICE (800) 222-0751

Assignments: Contract W2 • Contract 1099 • Contract for Hire • Permanent Placement

Positions: Applications Programmers • Database Administrators • LAN Administrators • Programmer/Analysts • Systems Analysts • Systems Programmers • Team/Project Leaders • Technical Writers

Pacific Northwest

PDG Pacific Data Group

We have a proven track record of systems integration and information services consulting. Our 8 years of double digit growth and market leadership is due to our strong ethics, skilled employees and ability to offer top pay.

PDG offers an attractive compensation and benefits package. For immediate consideration, mail, fax or e-mail your resume to: Pacific Data Group, Inc., 10300 SW Greenburg Road, Suite 230, Dept C, Portland, OR 97233.

Fax: (503) 293-3898. Tel: 503-293-2499.
Internet: 70540.314@compuserve.com.

- DB2, CICS
- IMS DB/DC
- IDMS/DC
- IDS/II
- COBOL, CSP
- Mipro
- Natural/Adabas
- PowerBuilder
- Oracle V6/V7
- Oracle Forms
- Oracle Case
- Progress
- Sybase
- SQL Server
- SQL Windows
- HP3000
- AD/JAD
- IEF, ADW

Now you have a better way to recruit university and college students planning computer careers:

Computerworld's eighth annual Campus Recruitment Edition

If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

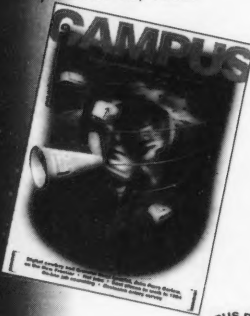
Now you can recruit computer talent on campus without leaving your office!

That's because 100,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Information Systems (IS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-related curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in *Computerworld's Campus Recruitment Edition*! For a rate card reflecting complete campus distribution, call John Corrigan at 800/343-6474 (in MA, 608/879-0700).

But hurry...
This issue closes
September 15, 1995.



GET
SERIOUS

If you're serious about a career in consulting, seriously consider CTG. With nearly 30 years of experience and a client list that includes the majority of the Fortune 100, CTG can offer you the challenge and support you need to succeed. Opportunities are currently available in the following areas:

ATLANTA, GA: • AS/400, RPG • Visual Basic/ ORACLE • ORACLE PL/SQL • PRO C with UNIX C Experience • LAN Technicians with Windows NT • Visual Basic, MS/SQL Server/Windows NT • Visual Basic, Fox Pro • Lotus Notes Developer • COBOL, CICS, VSAM • DATACOM DBA.

MEMPHIS, TN: • IMS, DBDC • COBOL/CICS/ DB2 • Sybase • DB2/DBA • COBOL/CICS/IMS.

NASHVILLE, TN: • COBOL/CICS/DB2 • DB2/ DBA • PowerBuilder/Sybase • Visual Basic/MS Access.

JACKSONVILLE, FL: • COBOL/CICS/DB2 - IMS a plus • Client Server Specialist with Sybase • System Programmer, DB2 with SMPE • DB2/DBA.

ORLANDO, FL: • C++/OLE/Networks • C++/MFC/ VBX/OCR/OLE • Lotus Notes • Senior INFORMIX DBA • Sybase/C++ • COBOL/CSP/DB2.

FT. LAUDERDALE, FL: • VAX/VMS System Administrator • ORACLE Forms/PRO-C • COBOL/ CICS/DB2 • UNIX System Administrator • IDMS/DB2.

TAMPA, FL: • COBOL/CICS/DB2 • Model 204/PL1/ SAS • ORACLE V.6 or 7 with Forms • INTERLEAF • IMS/DBDC • Risk 6000 with AIX/PROGRESS • UNIX/SHELL/SNO/PROGRESS.

If you're serious about your consulting career, make the right choice. Choose CTG. For more information, send your resume to:

CTG - Southern Region
Sourcing Center,
Dept. CW0828,
5730 Oakbrook Pkwy.,
Suite 105, Atlanta, GA 30093-1825.
Phone: 800-788-2159.
Fax: 800-345-5382.

ctg

For information regarding opportunities throughout North America, please call: 1-800-375-2084. You will be connected to the sourcing center in your area. Find out more about CTG by visiting our Web Site at www.ctg.com. EOE M/F/D/V.

CONTRACTORS

◆ INFORMATION SYSTEMS ◆

- ◆ AS/400, RPG DEVELOPERS
- ◆ SAS RESEARCH ANALYST
- ◆ C, UNIX, ANY RELATIONAL DBMS
- ◆ VISUAL BASIC, ACCESS, ODBC
- ◆ MVS, JCL, C PROGRAMMERS
- ◆ LAN ADMINISTRATOR, PC EXPERT WITH NOVELL, OS/2, WIN
- ◆ C, OS/2 APPLICATIONS DEVELOPER
- ◆ LOTUS NOTES DEVELOPERS
- ◆ PC SUPPORT, LAN, NOVELL
- ◆ ALPHA SYSTEMS MANAGER
- ◆ UNIX, C++, QA TESTING
- ◆ VISUAL BASIC/ACCESS DEVELOPER
- ◆ MUMPS DEVELOPERS
- ◆ SAS, MVS, C
- ◆ SAS, MVS, VMS
- ◆ POWERBUILDER, SYBASE
- ◆ ORACLE FINANCIALS DEVELOPER
- ◆ NOVELL/WINDOWS SUPPORT
- ◆ UNIX SYSTEMS ADMINISTRATOR

◆ SOFTWARE ENGINEERING ◆

OBJECT-ORIENTED

- ◆ WINDOWS '95, DNS, NIS, NFS
- ◆ WINDOWS '95, VISUAL C++
- ◆ VISUAL C++, MFC, FINANCIAL SERVICES
- ◆ VISUAL C++, WINDOWS NT, FINL SERVICES
- ◆ VISUAL C++, WINSOCK
- ◆ VISUAL C++, WIN 95, COMMS GUI
- ◆ VISUAL C++, IMAGING/SCANNING GUI
- ◆ VISUAL C++, 32-BIT MULTIMEDIA
- ◆ 32-BIT PORT TO OS/2
- ◆ OLE 2.0, VISUAL C++, CDK
- ◆ OLE 2.0, WIN 95, NT, GROUPWARE
- ◆ C, NT (MULTI-THREADING)

INTERNATIONALIZATION

- ◆ DOUBLE-BYTE ENABLING
- ◆ TECHNICAL TRANSLATORS
- ◆ I18N, L10N, QA ENGINEERS
- ◆ QUALITY ASSURANCE
- ◆ MS-TEST
- ◆ SENIOR OBJECT-ORIENTED QA/TESTING

Winter, Wyman ◆ Contract Services

PLEASE CONTACT MARK REDMOND:

617-890-7007 EXT. 3016
800-890-7002 OUTSIDE MA
FAX: 617-890-4433



E-MAIL: WINTER@WORLD.STD.COM
204 SECOND AVENUE, DEPT. CW
WALTHAM, MA 02154-1126

EXTRAORDINARY COMMITMENT
TO EXCELLENCE...

At Great Plains Software, recognized as one of the *The 100 Best Companies to Work for in America*, we take pride not only in providing the industry's top rated accounting software products and services, but also in our team of dedicated employees and outstanding community. Nestled in the Red River Valley near Minnesota's prime lake country, Fargo has ranked in the top 20% nationally for the past five years in Money Magazine's "Best Place to Live" rating. The Wall Street Journal ranks Fargo as the seventh best small market community nationally in which to start a career. Our continuous growth has created exceptional opportunities for computer professionals to contribute to our success:

SQA and Development Engineers

You will perform leading edge financial application software development on LAN-based PC, MAC and RISC processors. A degree in Computer Science, CIS or Software Engineering is required. Experience in MS Windows & MAC (GUI) application programming, Client/Server, C/C++, Microsoft C, Think C, Borland C, Visual Basic CDK, database, design and/or project management is a definite plus. Your 3+ years of professional experience in commercial software development and proven process knowledge to produce bug-free software will be rewarded! Technical capabilities are critical for these challenging positions.

SQL Support Engineer

This diverse position includes design, testing and technical support of hardware/software setup for C/S based GUI accounting applications. You will need a degree in Computer Science or related field, strong SQL background (Microsoft SQL Server or Sybase experience preferred), excellent interpersonal, communication and problem solving skills, and experience with leading edge technologies. Exposure to Windows and/or Windows NT, 1 year of accounting or business courses, and strong customer service skills are highly preferred.

In exchange for your expertise in an industry related field, we will reward you with a highly competitive salary and benefits package including profit sharing and 401(k), PLUS the opportunity to excel in an exciting, innovative environment.

We invite you to fax or send a resume and salary history to: Great Plains Software, Human Resources - CW, P.O. Box 9739, Fargo, ND 58109.
E-mail: sschmidt@gps.com Fax (701) 281-3322.
EOE



**GREAT PLAINS
SOFTWARE®**

ACCOUNTING AND BUSINESS MANAGEMENT TOOLS

ONE OF THE "100 BEST COMPANIES TO WORK FOR IN AMERICA"

Your Thinking Has No Walls.
Why Should Your Office?

When you know how to think outside the box, you shouldn't have to sit inside one. Your environment should parallel the solutions you develop—visionary, dynamic and unconfined by traditional ideas about business. You'll find that environment at SHL; it's one of the numerous reasons why we are widely credited with having defined business transformation.

At SHL, our professionals are busy showcasing their considerable entrepreneurial talents and analytical skills on five continents for a diverse Fortune 500 client base resulting in over \$1 billion in sales annually.

When you think about it, it's really no surprise that top professionals in the computer services industry have decided to join SHL. What about you?

CLIENT/SERVER
PROFESSIONALS

Currently, we are seeking seasoned individuals with a solid background in but not limited to ONE of the following:

- Oracle
- Sybase
- PowerBuilder
- SmallTalk
- Windows NT
- Novell
- TCP/IP

Please send resume and salary history to: SHL, Attn: Manager of Recruiting, Dept. CW-328, 13155 Noel Road, Suite 1001, Dallas, TX 75240-5095. FAX#: (214) 383-2799. E-mail: jfwebster@shl.com
SHL is an Equal Opportunity Employer M/F/D/V.

Business Transformation through Client/Server Computing

PROGRAMMER/ANALYSTS



Computer Horizons Corp., a leader in systems development, client server technology, and total project solutions, continues to be involved with many long-term projects requiring additional staff. We provide cutting edge solutions to our clients through a growing national network of 33 offices.

We have immediate needs for experienced professionals to staff new business opportunities. These positions require two or more years of experience with any of the following skills:

- DB2/DBA
- COBOL CICS DB-2
- LOTUS NOTES DATABASE ADMINISTRATOR
- AIX SYSTEMS ADMINISTRATOR
- PL-1, DB2, C/MF
- AS 400 RPG J.D. EDWARDS
- AS 400 COBOL
- POWERBUILDER/SYBASE
- POWERBUILDER/ORACLE
- ADABAS NATURAL DBA
- P/A NATURAL 2.1
- SMALLTALK GEMSTONE
- SMALLTALK VISUAL WORKS
- DATA MODELING KNOWLEDGE OF DATABASEHOUSE
- TESSERACT

We offer a highly competitive compensation and benefits package. To learn more about this opportunity, please fax or send your resume to: **Rosalind Silk, COMPUTER HORIZONS CORP., 1291 SW 29th Avenue, Pompano Beach, FL 33069. Fax 305-974-2470. An Equal Opportunity Employer.**



COMPUTER HORIZONS CORP.

ORACLE PROGRAMMERS & IS PROFESSIONALS

CSC is a world leader in the science of information technology and its application to achieve clients' business objectives. Our Applied Technology Division provides multidisciplinary technical services to a wide range of federal agencies and departments. We have opportunities available at our facilities in the following locations throughout the country: **Los Angeles, CA - Dayton, OH - Rome, NY - Albuquerque, NM - Alamogordo, NM - San Antonio, TX.**

Requires a BS/BA or equivalent experience and a minimum of 3 years programming experience. Extensive skills using SQL*Plus, Oracle 6 or 7, FORMS 3, UNIX, C, Pro C, PL/SQL, SQL*Report/Writer utilities.

Positions are also available for Systems Administrators and Network Administrators in a variety of technical environments throughout the country.

CSC offers competitive salaries and benefits. Please send your resume to: **Computer Sciences Corporation, Applied Technology Division, 6565 Arlington Blvd., M/C-125, Falls Church, VA 22042. Attn: Dept. CW828. FAX: (703) 237-2257. An Equal Opportunity Employer M/F/D/V.**



PRODATA INC. UNLIMITED CHALLENGE!

Due to our continued success as one of the West's leading System Integrators, we have immediate openings for IS Project Managers, PAs, and Software Engineers in:

Portland: IEF, DB2 (CICS and DBAs), IDMS/ADSO, Oracle, Sybase/Powerbuilder, Progress, OOP/GUI
PRODATA, 700 NE Multnomah #1100, Portland, OR 97232
(PH) 503-235-5776 • FAX: 503-235-5784

Salt Lake City: Powerbuilder, Visual Basic, Delphi, C++, DB2/IMS, Cobol, CICS, Oracle Tools, Informix, SQL/Server, Access, RPG/SYNON
PRODATA, 1100 E. 6600 S., Suite 200, Salt Lake City, UT 84121
(PH) 801-266-6138 • FAX 801-266-0067

We know that PEOPLE - NOT COMPUTERS - are the keys to our success!

Our career-emphasis includes:

- Career Growth
- Loaded Perks
- The Challenge of Diversity
- Outstanding Quality of Life
- Relocation Assistance
- Training
- Fortune 500 Clientele
- Excellent Compensation
- Continuing Education
- International Travel Opportunities
- Over a Decade of Sustained Growth



Programmer/Analyst to develop specifications for the development of manufacturing information and data collection systems; use Hindi language fluently in written and oral communication with manufacturing facilities in India; work with various U.S. and Indian manufacturing and engineering personnel to resolve technical, design and operational issues in support of factory automation and materials systems; code, test, debug and implement applications; is instructed by the design team and/or supervisory personnel; assist in the administration and development of procedures for execution of factory and materials applications; participate in the design and development of database products in support of factory and materials applications; and assist in the design, implementation, and support of interfaces to other manufacturing and support systems. Utilize HP9000/HPUX, ORACLE, ORACLE CASE dictionary, generator, and designer, dBase IV, C, X-Windows, OS/2, DOS, structural analysis, and design development, UNIX. Must have Bachelor of Science degree in Electrical and Electronic Engineering or Computer Science with two years of experience as Programmer/Analyst or two years of experience as Systems Analyst/Programmer and/or Programmer or any combination thereof. Coursework or experience must have included use of structured analysis techniques, ORACLE database, tools and CASE dictionary, generator, and designer, dBase IV, C programming language, X-Windows, UNIX, OS/2 and DOS. Experience or research must have included systems analysis, design, and coding of manufacturing systems in a production environment. Applicants must be fluent in written and oral Hindi, 40 hrs. M/F, 8:00 a.m. to 4:30 p.m., \$40,850 per year. SEND RESUMES TO 7310 WOODWARD AVENUE, ROOM 415, DETROIT, MICHIGAN 48202. REFERENCE # 111895. AN EMPLOYER PAID AD.

Computer Data Base Design Analyst. Design, develop, upgrade & troubleshoot programmable relational database information systems used in all aspects of business, including inventory control, purchasing & sourcing, customer records, financial records, etc. Develop data models, including: definition of data elements, application of Functional Dependency Theory; & drafting of Nested Entity Relationship Diagrams. Structure standard & non-standard queries using SQL. Design user templates & write internal user manuals. Network entire system. Conduct quality & productivity testing of system. Operating systems include VMS & Windows. 40 hr/wk, 9am-5pm. Yearly salary: \$37,700. Requires Masters degree in Computer Science & 6 mos exp. in job offered or 6 mos exp. as Graduate Assistant, Computer Science. Offer special requirements include: Education to include 2 courses in Data Base Organization & 1 course in Principles of Computer Networks. Exp. to include use of VMS & Windows operating systems, SQL, Functional Dependency Theory & Nested Entity Relationship Diagrams. Must have proof of legal authority to work permanently in the U.S. Apply to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State St. - 3 South, Chicago, IL 60605. Attn: Brenda Kelly, Ref. #V-13318-K. NO CALLS. AN EMPLOYER PAID AD - SEND 2 COPIES OF RESUME.

RESELLER ACCOUNT EXECUTIVE. JOB DESCRIPTION: Sells microcomputer software products including desktop applications, operating systems, database, word processing, spreadsheets, and database development tools to assigned reseller account. Identifies and prioritizes sales efforts through market research and analysis. Increases productivity and maximizes retail distribution and sales through the implementation and coordination of reseller education and training. Engages in marketing activities including marketing presentations, industry shows, and development of customer marketing initiatives. **REQUIREMENTS:** Bachelor's degree or equivalent in Economics or Marketing. Four years experience in job offered or four years of experience in sales to corporate accounts including territory development, to include two years of experience in implementing sales and mass marketing programs and pricing and distribution strategies for microcomputer application products (word processing, database, and spreadsheets) and operating systems. **JOB LOCATION:** Irving Area Employer. Salary Range: \$46,000-\$52,000/year depending on Experience. Hours: Monday - Friday 8:00 a.m. to 5:00 p.m. EOE. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #TX7504431. Ad Paid by An Equal Opportunity Employer.

Due to continued growth across the country, Technisource, a leading national information systems and engineering contract and consulting organization seeks

ENGINEERS SOFTWARE ENGINEERS PROGRAMMERS ANALYSTS

We provide an excellent salary and benefits package. Please send resumes to our Corporate Office, Dept. CV950828, 1901 NW 62 St. #401, Ft. Lauderdale, FL 33309. Fax 305-493-8603. E-mail techsorc@technisource.com. EOE

TECHNISOURCE

Senior Consultant needed for computer consulting firm located in Portland, Oregon. Job duties include systems analysis, development, database design, and data modeling using IEF CASE Toolset, IBM AS/400, COBOL II, IMS/DC, and DB2. Applicant must have a Bachelor's degree in electronic engineering or computer science. In addition, applicant must have 4 yrs exp. in the job duties described above or 4 yrs. as a Systems Analyst which includes exp. with COBOL II, DB2, IMS/DC and 1 yr. exp. with data modeling using the IEF CASE Toolset. 8:00 AM-5:00 PM, Mon.-Fri. 40 hrs/wk., \$57,500/yr. Please send resumes in duplicate and cover letter (NO CALLS) to: Employment Department, ATTN: Job Order Number 5550978, 873 Union Street N.E., Room 201, Salem, Oregon 97311.

Senior Programmer Analyst. Duties: design, develop, and maintain CIMPRO accounting/financial database software, using Thoroughbred Basic and IDOL-4 programming languages; design and develop custom applications and controls using C++ programming language; install and maintain LANs and WANs using Novell Netware Operating Systems, and maintain and debug Cisco/Routers/Bridges used in Networking computers; serve as system administrator for AIX Operating System using a RS/6000 platform; and troubleshoot problems in general user applications, including the word processing, spreadsheet, and e-mail software. **Requirements:** BS degree in Information or Computer Science, or Electrical or Computer Engineering. One year six months experience in job offered or as systems analyst, computer programmer, programmer analyst or related position. Experience must include 1 yr of exp using AIX Operating Systems and RS/6000 platforms; 1 yr exp using C++ programming language; 1 yr exp using Visual Basic or Basic programming language; 6 mo exp managing LANs and WANs; 6 mo exp using TCP/IP communication protocol, and course or lab work in relational databases. Salary \$45,000/yr. EOE. Must have proof of legal authority to work in the U.S. Qualified applicants may apply in person or with resume to: Georgia Department of Labor, Job Order # GA 5887148, 2972 Ask-Kay Dr., Smyrna, GA 30082-2309 or the nearest Department of Labor Field Service Office.

Multiple openings exist for Systems Analyst for software consulting firm. Duties include: Design, analysis and standardization of the development of software applications for financial systems. Includes managing the project, creation of the general system and detailed system design, preparation of standards for the development environment and system testing. Also includes working in Relational Database environment such as: Informix, Oracle, or Sybase under UNIX using structured technique; and use of TCP/IP, uucp, ftp, and SQL. Requires a Bachelor's degree in Computer Science. Requires two years experience in the job offered or two years experience as a Software Consultant to include the following experience: Informix; UNIX; SQL; Oracle. Salary is \$52,000.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #147095. Employer paid ad.

TELECOMMUNICATIONS ANALYST: Analyze, design, install, maintain and troubleshoot different network operation systems. Configure and optimize applications that run under Windows NT, UNIX, Mac and Netware OS. Implement cost-effective network solutions for users needing remote access to corporate LANs. Design and manage various communications systems that consist of dial-in modem pools and routers in corporate LANs to support direct and dial-up connections. Monitor serial communications, binary data transfer and network traffic. Interface with client in implementing Electronic Data Interchange (EDI), Electronic Commerce (EC) and Continuous Acquisition Lifecycle Support (CALS) standards. Bachelor's degree in Computer Science and 1 yr. exp. in job offered or as Graduate Assistant required. Salary \$40,000/yr. Apply at the Texas Employment Commission, Palestine, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #TX7502824. Ad paid by an Equal Employment Opportunity Employer.

TANDEM

COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

STRATUS

PL1, COBOL, C, X.25

MUMPS, UNIX

SUN, HP, RS/6000, GUI, SDK, Powerbuilder, C++, Visual Basic, Futures/Consulting Positions available in the US/ABROAD

STRATEM

800-582-JOBS

TEL (212)967-2910 FAX (212)967-4205

124 W. 30th St. Suite #302 New York, N.Y. 10001

Sun, Fun & Technology in Phoenix, AZ

Discover the hottest technology in a warm, supportive environment at Milestone Technology. We currently have the following contract and contract-to-hire opportunities available:

- MISC/DB2
- AS/400
- DB2/CICS
- DATA ANALYST
- AIX/UNIX/C++
- WINDOWS/AT
- COBOL/SQL
- SYBASE
- COBOL/CICS
- POWERBUILDER
- DB/1
- COBOL/VSAM

Milestone Technology, Inc.
100 W. Broadway Rd., Ste 205
Tempe, AZ 85283
Fax: (602) 964-5542
Phone: (602) 964-6115
EOE



CONTRACTS

*DB2/CICS *C, SQL
*DATACOM/DB *VIS BASIC
*POWERBUILDER/UNIFACE
*ORACLE/SYBASE DBA/PA
*C++, WINDOWS 95/NT
*COBOL, IMS, (CICS & batch)
*SYS PROG (MVS/AIX)
*ADABAS/NATURAL

SOURCEONE SOLUTIONS, INC.
45 Accord Park Dr.
Norwell, MA 02061
Call 617-871-4211;
Fax 617-871-4491; or email
Source1@world.std.com

Recruit the best!

Place your recruitment advertisement in regional or national editions of *Computerworld's Computer Careers* section.



For more information, call Lisa McGrath at 800-343-6474 x8201, in MA 508-879-0700.

Weekly. Regional. National. And it works.

An IDG Communications Newspaper

FDSI

CONSULTING

FDSI Consulting provides job opportunities with a diverse client base fueled by a 30% annual growth rate. We provide individuals and consulting teams to many of the Pacific Northwest's top employers, from fast-track technology companies to Fortune 500 giants.

At FDSI Consulting, we match your work style with like-minded clients, and provide extensive onsite support and career guidance. And we put bread on your table by paying you some of the most competitive wages in the industry. We offer an excellent benefits package that includes: Medical, vision, dental insurance; Disability and life insurance; 401K and profit sharing plans; Up to six weeks paid time off; Training allowance and guidance; Multiple assignment options

Current Opportunities

We have over 100 Puget Sound openings to be filled immediately. We are looking for people with 3+ years experience in all areas including:

- Visual Basic
- SQL Server
- Data Modeling (ERwin)
- Oracle Development & DBA
- PowerBuilder
- Visual C++ / MFC
- Excel VBA / Pivot Tables
- Internet/Firewall
- CICS
- IMS
- DB2
- Business Analysis
- Project Management (C/S)
- Data Analyst (C/S)

Call: (206) 637-6505

Fax: (206) 637-1805

Internet: fdsi@cerf.net

P.O. Box 3008 • Bellevue WA • 98009-3008

With openings coast-to-coast, you could land a great growth career.

We're Systems & Computer Technology Corporation (SCT), a leading provider of application-specific software and computing management services to higher education, utilities, local/municipal governments, cable and manufacturing/distribution systems nationwide. Our exceptional growth — revenues have tripled over the past 5 years alone — has created many solid opportunities for ambitious, career-minded individuals.

With so many locations, there is undoubtedly one that's just right for you. Positions exist at the following locations:

Richmond Area

- Software Developers
- Background in C, C++, ORACLE, FORTRAN
- DBAs/ORACLE

New England

- Network/PC Support Specialists/LAN & WAN
- Systems Administrators/UNIX/VAX
- UNIX/Systems Programmers

Southern California

- Network/PC Support Specialists/LAN & WAN

Northern California

- Network/PC Support Specialists/LAN & WAN
- Software Developers/ORACLE

Chicago Area

- Network/PC Support Specialists/LAN & WAN
- MIS Director

SCT also has nationwide opportunities in multiple locations for:

- MIS Directors
- Technical Specialists
- Functional Consultants

For immediate attention, fax your resume (clearly indicating position and area of interest) and salary requirements to the attention of: Chris Jordan, Dept. TCCW548, FAX: (610) 725-7560. Or call: 610-648-3006, SCT, 4 Country View Rd., Malvern, PA 19355. Equal opportunity employer m/t/d/v.



THE PACIFIC NORTHWEST

Portland, Oregon • Seattle, Washington

The Pacific Northwest offers coastal resorts, mountain ranges, reasonable cost of living, and challenging consulting work with Computer People Inc. (CPI), an international provider of information technology solutions.

CPI has been providing consulting services in the Pacific NW for nearly 15 years. Currently, we have exceptional opportunities for experienced systems professionals with a minimum of 3 years of applications development experience, and demonstrated expertise in any of the following areas:

IBM MAINFRAME

COBOL, COBOL II
DB2, CSP
IMS DB/DC
IDMS, ADS/O
CICS, VSAM

CLIENT/SERVER

SQLSERVER DEV/DRA's
MS WINDOWS, NT, '95
UNIX, C, C++
VISUALBASIC, ACCESS
ORACLE 7, FINANCIALS 9, 10
POWERBUILDER, SYBASE

Our progressive organization provides competitive salaries and comprehensive benefits including paid overtime. Hourly positions with or without benefits are also available. Please call (800) 274-3707, Fax to (503) 223-1294. E-mail to: recruiting@cppeople.com. AA/EEO.



Looking For A Window Of Opportunity?

Technology Consulting, Inc. is a dynamic and rapidly growing Software Development Firm with challenging assignments. We are a leader in application outsourcing. Current client projects and our regional development center require the following skills:

CLIENT/SERVER

C++, Visual Basic, Visual C++, MS/Access, Oracle, SQL*FORMS, Sybase, Powerbuilder, Windows NT, OS/2, SAP R/3, UNIX Administrator

AS/400

RPC/400

MAINFRAME

COBOL, CICS, IMS DB/DC, DB2, GENTRAN EDI, DEC/VAX, ADW

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call: 800-829-4824.



1800 Medinger Tower, Louisville, KY 40202 FAX: 502-589-3107

• Dallas • Denver • Des Moines • Detroit • Houston • Indianapolis • Kansas City •

Take Control of Your Career

CIBER provides customized computer application software consulting, development and implementation, ranking among the top companies in the \$20 billion information technology industry. We grew over 200% from last year and ranked #32 in Forbes' *The World's Best Small Companies*. CIBER delivers its services nationwide and is one of the fastest growing companies in the U.S. today. A recognized leader in high-quality implementation of information technology solutions, CIBER focuses on continuous refinement of its services while adapting to a marketplace characterized by rapid change. Interested candidates must have one or more of the following skill sets:

MS/Access
Windows/NT
Lotus Notes
Visual Basic
Smalltalk
Informix
Adabas/Natural

Oracle 6.0 7.0
C++/OS2
C/C++
Sybase
System Admin.
Oracle Financials
Data Modelers

SAP
IMS DB/DC
Powerbuilder
DB2/CICS
AS/400
Peoplesoft
DBAs

For immediate consideration for these opportunities across the country, please contact us ASAPI



CIBER National Recruiting
Dept. CW 8/28
4100 E. Mississippi Avenue
Suite 1700
Denver, Colorado 80222
Phone: 1-800-669-0401
Fax: 1-303-782-4861

Equal Opportunity Employer

IEF Developers required for 12 month+ contracts

We're looking to fill a number of analyst/programmer/developer roles to complement the professional teams working on Australia's leading IEF project for the country's largest telecommunications carrier.

Successful applicants will have at least 18 months of recent IEF experience, including specific design and construction experience within a large systems development environment. (Preferably IBM Mainframe).

Offering attractive remuneration packages that include excellent hourly rates and relocations costs.

For more information please FREECALL Trevor Unger on 1-800 2304 518 or fax on (+613) 9286 7522.

Level 14, The Tower, 360 Elizabeth St., Melbourne 3000, Australia.

CONSULTANTS

SPEAK UP

and you'll be heard across the country and throughout the industry! SEEK Consulting is a rapidly growing, full-service contract placement firm — and when you speak, we listen. As market savvy staffing specialists, we actively promote the interests of the companies we work with and the consultants who work with us. Whether you're a hiring manager in need of a network of technical talent, or a career minded systems professional seeking a wide range of challenging assignments, think of SEEK Consulting as your partner — your voice in today's marketplace.

SEEK

Current Contract Opportunities:

- Oracle Financials
- Progress V7, UNIX
- PowerBuilder/Sybase, Oracle
- Visual Basic, Access or SQL Server
- Smalltalk, Digital
- OS/2, Real-Time, IBM Tools
- Oracle, Sybase DBA's, Developers
- SAP R3
- ATM Real-Time Embedded
- DOS/Windows Driver Development
- NT, SDK, MFC
- HP-UX System Administration
- Lotus Notes Developers
- UNIX Device Drivers, SCSI
- C++, SNMP, MIB Development
- Oracle/Sybase, ODBC

- Windows, OLE, DDE, NT
- SQL Windows, C, C++
- C, C++, S7, ISDN
- HP OpenMail, cc: mail
- VC++, Windows, MFC
- HP OpenView
- MS Mail Administrator
- NT Porting, Sun, C++
- C++, Windows, XVT
- Real-Time Embedded S/W, 68HC11 or 68302
- C++, Device Drivers
- MAC, Sys 7
- UNIX System Admin.
- MS-Access, Oracle V7
- Oracle CASE Designers

Opportunities available throughout the U.S.

Enjoy all the advantages of partnering with SEEK, including our state-of-the-art SCREAM™ database. Stop searching for the perfect position - instead, SEEK ongoing opportunities by sending your resume to: **SEEK Consulting Group, Inc.**, Attn: Dept. CW, 401 Edgewater Place, Suite 130, Wakefield, MA 01880; Phone: 1-800-274-1174; Fax: (617) 246-8246; Internet: jobs@seekcon.win.net

SEEK CONSULTING

HARDWARE/SOFTWARE VENDORS

Salaries to \$100,000

Outsource Manager - Client seeks managers with experience directing an outsourced programming group.
Product Development Manager - Requires product development management in a UNIX or WINDOWS or OS/2 arena.
OS Reliability, Availability Mgr. - Manage group directing RAS features for PC Operating Systems for a PC manufacturer.
Mainframe Developer - Requires 5+ yrs IBM ALC, DB2 and MVS.
Compiler Developer - Will be part of a team specifying PC level compilers. Must have compiler development exp.
QA - Multiple positions requiring strong hardware or software QA exp.
Firmware Mgr. - Will manage firmware development for a PC manufacturer.
Development Programmers - Multiple openings with clients around the country developing desktop and mainframe software products. Typical skills required include C, C++, Smalltalk, PowerBuilder, IBM assembly.

APPLICATION DEVELOPMENT POSITIONS

Salaries to \$75,000

DBA - 1+ year Oracle, DB2, IDMS, ADABAS, SYBASE or INGRESS.
System Prog. - 3+ yrs MVS, DB2, IMS, VS/VM or VTAM.
P/A - Any combination of CICS, DB2, IDMS, ADABAS or Oracle.
AS/400 P/A - RPG or Cobol, SYNON a plus.
EDP Auditors - Degree, CISA or CPA a plus.
Life Insurance - PC or Mainframe exp. P/A and Proj Managers.
Mfg. Software Engineer - 2+ years mfg. Cobol, C, Smalltalk a plus.

ROBERT SHIELDS & ASSOCIATES

PO Box 890723 • Houston, TX 77289-0723

713/488-7961 • Fax 713/486-1496 • email: ITJOBS@AOL.COM

National Leadership. Personal Excellence.

Computer Professionals

Hestair is committed to building the finest technical services expertise in the industry. A part of BET, a \$3.5 billion worldwide corporation, Hestair is hiring experienced professionals for positions requiring skills in:

- Oracle
- Sybase
- PowerBuilder
- Visual Basic
- Informix
- C++
- AS400
- COBOL/CICS
- IMS
- DB2
- SAP
- TPF

Please reference Dept.

CW0895 when e-mailing

your resume to

mdvalach@cerfnet.com,

or faxing to 800/

440-5480. EOE.

HESTAIR

A BET COMPANY

NEW YORK

NEW JERSEY

DETROIT

CHICAGO

DENVER

ATLANTA

DALLAS

HOUSTON

SAN FRANCISCO

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

For over

two decades,

Computerworld

has delivered

qualified job

candidates to

America's

employers.

And ever since
Computerworld's
 first weekly issue in
 1967, America's
 companies have relied
 on *Computerworld*
 to target America's
 most qualified computer
 job candidates.

To place your advertisement
 regionally or nationally, call
 John Corrigan,
 Vice President/Professional
 Development Division,
 at 1-800-343-6474; x8201
 (in MA, 508/879-0700).

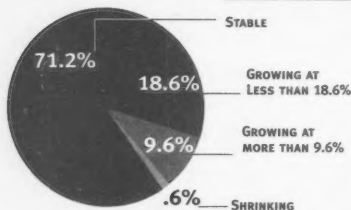
COMPUTERWORLD

CAREER SURVEY: Manufacturing Software

INDUSTRY HIRING TRENDS

OVERALL GROWTH RATE

11%

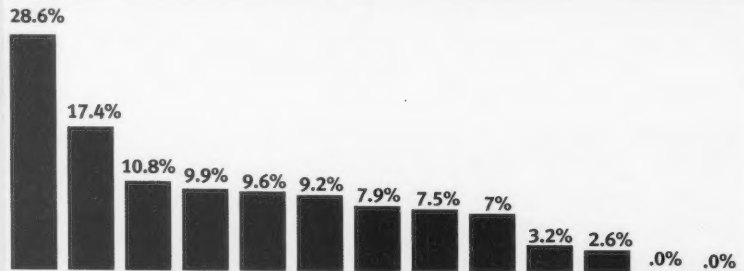


SURVEY BASE: 737 TECHNOLOGY FIRMS
 INVOLVED IN MANUFACTURING SOFTWARE

SURVEY CONDUCTED BETWEEN MAY '95 AND JULY '95;

© Copyright 1995, Corporate Technology Information Services, Inc., Woburn, Mass

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 29,383 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

Attention IS Professionals

Find out where the money is!
**Computerworld's 1994/1995
Salary Survey** disk is just what you
need to get an inside look at what
professionals are getting paid.
Get the facts on:

- Salaries in 28 IS specific job titles
- Salaries in 21 industries
- Salaries by geographic regions -
not published anywhere else

COMPUTERWORLD'S EIGHTH ANNUAL **SALARY SPECIAL REPORT SURVEY**

Rich, poor or in the
middle, many IS
professionals have their
pay linked to their
performance, our latest
report on pay trends
finds. And many more
wish they did.



By Alan R. Earls
Cash On Delivery

Call toll-free

1-800-495-0157, ext.10



**ONLY
\$99**

Call to order
**Computerworld's
Salary Survey** on
disk today.

Marketplace

Financially III

By Herman Mehling

Good integration and low implementation costs are important to financial software buyers

Imagine that your company has decided to replace the mainframe with client/server technology. Everybody who is anybody in top management agrees the financial application must be the core software in the new world. So far, so good. Now comes the monumental decision of choosing the application that will work best for your organization.

Do you want a stand-alone, best-of-breed solution or an integrated package with financials as one module or part?

Regardless of whether companies choose a stand-alone or integrated solution, the biggest issues are the extent to which any given package fits their business processes and the cost of buying and customizing software.

"When companies buy instead of build a solution, they must be willing to change at least some of their business processes to fit the software," says Ed Pillard, national director of the client/server consulting practice at Coopers & Lybrand in

Metuchen, N.J. "They [also] have to assess the cost of customizing the various packages they review."

All companies wrestle with these issues to varying degrees. For some, such as Diamond Shamrock, Inc., a San Antonio-based refiner and marketer of petroleum products, the decision-making process can be protracted and densely detailed.

Diamond in the rough

Last year, Diamond Shamrock spent months evaluating 25 vendors and subjecting the financial applications of four candidates (Dun & Bradstreet Software, SAP America, Inc., Oracle Corp. and Lawson Software) to more than 300 technical and business criteria. It finally gave the nod to Lawson.

"There wasn't much difference between the four packages in terms of number crunching, but Lawson came out ahead for its architectural design and cost of implementation," says Chuck Oakes, manager of client/server computing and network technology at Diamond Shamrock. The Fortune 200 company, bought Lawson's full suite of enterprise applications — financials, human resources, distribution and materials management.

Oakes says Lawson's solution met Diamond Shamrock's need for an integrated package that would allow the company to re-engineer business processes, blend the financial applications into its

refining operations over time and give users more control of their applications. "At no stage did we consider looking for a 'best of breed' for each business area," Oakes says. "We didn't want to have to write and support interfaces for those applications."

Diamond Shamrock also wanted to avoid a complex implementation. "Using Lawson, we were able to stagger the implementation of the financials, something we couldn't do with other vendors' products," Oakes says. The cost of implementing Lawson software was modest compared with projected costs for other applications.

"Implementation costs can range anywhere from three to 15 times the amount you pay for the software and require bringing in a horde of consultants," Oakes adds.

The promise of a low-cost, extremely fast implementation of financial, cost accounting and asset management client/server software drew *The Seattle Times* to SAP America's R/3.

Last September, the newspaper went live with R/3, just 90 days after it signed on the dotted line. It bought the software through SAP Special Delivery, a bundle program that delivers R/3 software, Hewlett-Packard Co. hardware, Informix

Financial processing done on a client/server system:

Base: 71 respondents

Processing amount	Number of respondents
Less than 40%	30
40%-59%	11
60%-79%	10
80%-99%	10
100%	10

When companies expect to reach a 100% level:

Base: 61 respondents

Amount of time	Percentage of respondents
Less than 6 months	11%
6 months to 1 year	7%
1 to 2 years	30%
More than 2 years	26%
Never	26%

Software, Inc.'s database, service and support from ICS/Deloitte Touche, Microsoft Corp. tools and Novell, Inc. networking.

"Our goal was to pull a financials package off the shelf, not have to customize it or hire others to do it, and be able to integrate the package with our other business systems," says Laurie Stanton, an information systems analyst at the newspaper. "SAP offered us a complete package that was very attractive financially and functionally."

Financials only

An entirely different story comes from E. W. Blanch, Inc., a reinsurance firm with offices in 10 cities and headquarters in Minneapolis.

With no immediate need to link its financials to other business systems, the firm chose to run with a financials-only package — SQL Financials from SQL Financials International, Inc. in Atlanta. "We were looking for a true client/server financial app with executable code that was separated from its database because we wanted to use Microsoft SQL Server as a database," says Linda Eshelman, a programmer/analyst.

Pillard advises companies to look beyond immediate needs. "Many companies go into client/server with their blinders on and don't think about how this or that application will fit into their overall systems environment five years down the road," he says.

Mehling is a freelance writer in San Anselmo, Calif.

Integration issues

82% of 78 respondents say integration of financial applications with other applications is very important.

40% of 81 respondents say the integration they experience is good or very good. 48% say it's average or poor; 12% don't know.

Source: RFI report released from Computerworld's Research survey

How flexible is your vendor on price?

Base: 81 respondents

Very flexible	7%
Flexible	19%
Average	48%
Reluctant	19%
Totally inflexible	7%

ADVERTISERS LISTINGS

INDEX

Buy / Sell / Lease

Carlson Computer Int'l (800) 334-7073

pg 116

Computer Presentation

Boxlight (800) 762-5757

Panelight (800) 726-3599

pg 115

pg 116

Network Security

Knozzall (800) 333-8698

pg 115

Outsourcing/Remote Computing

Alicomp (800) 274-5756

American Software (404) 264-5770

Faneuil Systems (708) 574-3636

pg 115

pg 116

pg 116

Security

Secure It (800) 451-7592

pg 116

Training for Corporate End-Users

Keystone Learning Systems (800) 748-4838

pg 115

Used Equipment & Deinstallation

Electronic Resource Recovery (914) 427-2151

pg 116

CLASSIFIED SOLUTIONS DIRECTORY

Bids & Proposals

Outsourcing

TRADESHOWS & EXHIBITIONS

Networks Expo

Dallas

September 12 - 14:

Interop & Network

Atlanta

September 25 - 29:

Unix Expo

New York

September 26 - 28:

Software Developers Conference

Washington, DC

October 3 - 7:

Sim Fall Conference

Orlando, FL

October 22 - 25

Comdex Fall

Las Vegas

November 13 - 17

MARKETPLACE

Where IS Buyers Find Solutions

Premier Solutions

When you buy from Boxlight, you'll get the exact system for your needs. We don't limit you to just a few products. You can choose from over 50 models in stock. Our

Advanced Color
Boxlight ColorShow™ 2000

\$3999

Boxlight ColorShow™ 2000

trained people will ask you questions and guide you to the exact solution for your situation, sometimes at a lower cost than you might have thought possible. And, we guarantee to ship your order in less than

NEW LOWER PRICE!

\$1999

Boxlight ColorShow™ 1200



WHEN WORDS ARE NOT ENOUGH...

CALL BOXLIGHT!

1-800-762-5757

Government: (800) 457-4009 • Resellers: (800) 736-6356
International: (360) 779-7903 • Rental: (800) 736-6954 • Fax: (360) 779-3299

Why buy from Boxlight Direct? Immediate dialog with knowledgeable people the first time you call. Immediate help in finding the most appropriate equipment for your unique situation. Front our on-hand inventory of over 50 models. Immediate service of everything we sell by our in-house service group. Industry leading Uptime Assurance Program. Immediate overnight delivery to multiple world-wide locations. Hassle-free 30 day money back guarantee. Rentals. Free lifetime after-the-sale technical support should you have any questions. Call today and ask for a catalog.

BOXLIGHT DIRECT

VISA MC AMERICAN EXPRESS FedEx UPS

24 hours wherever you need it even if that means multiple locations world-wide. When your new equipment arrives, it's ready to go. Set-up is about as simple as using a toaster. If you ever have questions or need help, our Technical Support Group is standing by with free after-the-sale phone assistance. Every work day. Forever. No charge.

\$2999

Boxlight ProColor™ 1301

CALL FOR OUR LATEST SPECIALS!

Purchasing presentation equipment doesn't get any more convenient. Just pick up the phone and dial. There's absolutely no risk in buying from us, because if you're not happy with your purchase, call us within 30 days and return it for your money back. No hassle. No risk!

FILEAUDITOR® TELLS ALL!

WHO GOT INTO WHAT FILES, WHEN?

FileAuditor enhances your network security by...

- ▲ Tracking file and directory activity on the network.
- ▲ Having proactive network security with NLMAuto or NLMerlin
- ▲ Denying access to specific files.
- ▲ Generating custom reports.

If you need enhanced network security

Call: **1-800-333-8698**

FAX: (602) 545-0008

Knozz Systems, 375 E. Elliot Rd., #10 Chandler, AZ 85225

A Division of Tangram Enterprise Solutions



ALICOMPI/CBS

A Unique Outsourcing Services Provider

OUTSOURCING • REMOTE COMPUTING

TRANSITIONAL AND LONG TERM CUSTOM SOLUTIONS
VM • MVS • VSE 105,000 sq.ft. SECAUCUS, NJ COMPLEX

"OUR PLATFORM IS CUSTOMER SATISFACTION"

SERVING CLIENTS SINCE 1980

800 274-5556 • 212 886-3600

Video Training for Your Entire Enterprise



Dawn Bjork
Microsoft Certified Trainer
& MS Word Instructor



Rob Aronson
NetWare 4.1 Instructor
& Novell CUI & CDE



Alison Baltas
Microsoft Certified Developer
& MS Access 2.0 Instructor

Call for Free Demo Video and Catalog

Word 6.0

Reg./Int/Adv (ea) \$49.95
Special-All Time \$129.95

Access 2.0

Reg./Int/Adv (ea) \$49.95
Special-All Time \$129.95

Windows 3.1

Reg./Int/Adv (ea) \$49.95
Special-All Time \$129.95

Excel 5.0

Reg./Int/Adv (ea) \$49.95
Special-All Time \$129.95

Project 4.0

Level V/U/W/V (ea) \$79.95
Special-All Four \$299.95

Other Videos

PerfectOffice SmartSuite Visual Basic

NetWare 4.1

Level 1/2/3/4 (ea) \$89.95
Level 5/6/7 (ea) \$89.95
Special-Any Four \$329.95
Special-All Seven \$495.95

Lotus Notes 3.x

App. Dev. Lev 1 \$89.95
App. Dev. Lev 2 \$89.95
Sys. Admin. Lev 1/2 (ea) \$89.95
User \$49.95
Special-All Five \$379.95

Windows NT 3.5

Installation \$89.95
NT Server Level 1 \$89.95
NT Server Level 2 \$89.95
NT Workstation \$89.95
Special-All Four \$299.95

SQL Server 4.x

Call SQL Serv. Lev 1/2/3 \$99.95
VB/SQL Connection \$89.95
Special-All Four \$329.95

Special Microsoft Office Video Combinations

Microsoft Office 4.x Standard \$349.95

• 1 Word 6.0, 1 Excel 5.0, 1 PowerPoint 4.0

• 13 videos with over 17 hours of training

Microsoft Office 4.x Pro \$495.95

• 1 Word 6.0, 1 Excel 5.0, 1 Access 2.0

• 3 PowerPoint 4.0, 1 MS Mail training videos

• 13 videos with over 24 hours of training

Microsoft Office 4.x Plus \$679.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft SOLUTION PROVIDER

3 Easy Ways to Order:

CALL 1-800-748-4838

801-375-8680

FAX 1-801-373-6872

MAIL KeyStone Learning Systems Corp.

2181 Larson Parkway

Provo, UT 84606

ADD CDSG



Ask About Windows 95 & Office 95

Package 2 hours per video



We accept E.O.D., Company P.O. or check

Power Tools for the Power Presenter

One stop
shop for
all major
brands



COLOR
from
\$1,795

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

Call for CATALOG 1 800 726 3599

Panelight
by LAY SYSTEMS, INC.

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST
VOICE: 415 772 5800 FAX: 415 986 3817

Käblit™ Security

NOW!

STOP COMPUTER THEFT IN THE OFFICE — ON THE ROAD

- Secure computer or notebook to desk, table, etc.
- Protect data
- Lifetime warranty



Quick And Easy To Install!
Compact — Lightweight!
Available For Macintosh Computers Too!

Padlock Security
Provided by
Master Lock



Order Now — Call 800-451-7592

Secure-It

18 Maple Court, East Longmeadow, MA 01028, USA 413-525-7039

The particular Master® Lock Trademarks used are trademarks of the Master® Lock Company and are used by Secure-It, Inc. under license.

CARLSON COMPUTER INTERNATIONAL

- BUY •
- LEASE •
- SELL •
- TRADE •
- RENT •

- SYSTEMS
- UPGRADES
- DISKS
- WORKSTATIONS
- MEMORY
- PERIPHERALS

DEC & SILICON GRAPHICS

NEW ... Discounted from list price
USED ... At a fraction of list price

"We love spending money buying computer gear"

800-334-7073

Association of the
dda
DEC Marketplace
CARLSON COMPUTER INTERNATIONAL
11956 BERNARDO PLAZA DR. #503
SAN DIEGO, CA 92128
(619) 675-3377
FAX (619) 675-3379

Buy, Sell, Deinstall

- Purchase of used mainframe systems and peripherals
- Deinstallation Services

Wanted to Buy

• 3370 • 3420
• 3380 • 3422
• 3390 • 3480
4381 • 3090

914-427-2151 Fax: 914-427-7791

ERR Electronic Resource Recovery
PO Box R • Henry Henning Dr.
Maybrook, NY 12543-0316
Contact: Bob Hewitt

X Your best choice for mainframe computing services.

REMOTE

COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636

New England 617-595-8000

815 Commerce Drive, Oak Brook, IL 60521

**FANEUIL
SYSTEMS**

Outsourcing



Call today for more information
404-264-5770.

Supplement your IS operation...

- Mainframe Processing
- Report Distribution to CD-ROM
- AS/400 Remote Management
- Network Management
- Applications Support
- Operations & Technical Support, and more

**Quality Account Management
Satisfied Clients**

We will help evaluate your options, formulate a flexible strategic and expeditious plan to help reach your goals - and get the fastest return on your investment.

The Outsourcing Group
A Unit of American Software USA, Inc.
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

Computerworld Marketplace:

The Buy That Will Help You Sell More
With Access to Buyer Profiles!

To find out more about advertising in Computerworld Marketplace and how you can earn access to buyers from the CW Buyers Database, call your Computerworld Marketplace sales representative today!

800-343-6474, ext. 744

Attention IS Professionals

Find out where the money is!
Computerworld's 1994/1995 Salary Survey disk is just what you need to get an inside look at what professionals are getting paid. Get the facts on:

- Salaries in 28 IS specific job titles
- Salaries in 21 industries
- Salaries by geographic regions - not published anywhere else



Call to order **Computerworld's Salary Survey** on disk today.

Call toll-free 1-800-495-0157, ext.10

OVERSEAS SOFTWARE DEVELOPMENT

You Could Save 60% or More
SHORT TERM

We develop software **FOR**
 you

LONG TERM

We will help you set up your

DataSoft
 CONSULTING, INC.
 201-746-2892

METROPOLITAN TRANSPORTATION AUTHORITY NOTICE is hereby given that the Metropolitan Transportation Authority (MTA) will receive proposals for the following services. Copies of the documents may be secured from Ms. Jean Allan, Procurement Services, Metropolitan Transportation Authority, 347 Madison Avenue, New York, N.Y. 10017 or by calling (212)878-7209.

REP #

6-01-95099-0

FOR: Off-The-Shelf Single Point Access Software.

DATE/TIME

9/12/95, 4pm

REP #

6-01-95151-0

FOR: Off-The-Shelf Collection Mgmt Software for a Public Fine Arts Collection which includes Imaging and Conversation Feature.

To place your advertisement in the Classified Solutions section CALL 1-800-343-6474 ext. 744

"...Based on the Number of Quality Leads Generated per Advertising Dollar Spent, Computerworld Marketplace Ranks at the Top of the List for Cost Effectiveness."

- Brad J. Gleason, Marketing Director
 BOXLIGHT CORPORATION
 Poulsbo, Washington

COMPUTERWORLD
 Marketplace

The Business Charter. Backed by 10 years of expertise, BOXLIGHT has established itself as the country's leading source of LCD projection and presentation systems, offering more than 50 models of computer projection panels and accessories to businesses worldwide. Just recently BOXLIGHT was named to the INC. 500 - the top fastest growing, privately held firms in America.

The Target Audience. "As the only company selling its computer-based presentation products direct, BOXLIGHT targets the strongest influencers in corporate technology decision-making. That includes computer-savvy IS managers, CIOs, and network managers, primarily in the Fortune 1000, government, and higher education, who create training, sales, and meeting presentations.

The Advertising Vehicle. "As a national reseller with a direct-response orientation, we want our advertising to provide users with easy access to our products nationwide. This capability is best demonstrated with four-color classified advertising. Our weekly advertisements in Computerworld Marketplace generate strong response from the most powerful influencers in information technology decision-making. We definitely reach an audience of key business users who not only understand the value of technology-based tools, but also have the authority to purchase them.

The Results...Bottom Line. "For both quantity and quality of leads generated, Computerworld Marketplace consistently earns an "A" performance rating. That's why BOXLIGHT has come to rely on Computerworld Marketplace to generate new business. After extensive testing of our advertising's effectiveness, we're doubling the size of our weekly Computerworld Marketplace advertisements throughout 1995. Because...based on the number of quality leads generated per advertising dollar spent, Computerworld Marketplace ranks at the top of the list for cost effectiveness."

Microsoft

SOLUTION PROVIDER DIRECTORY

ADVANCED SYSTEMS TRAINING

Hilton Computer Strategies
5001 Savoy #207
Houston, TX 77056
Hilton Computer Strategies is the premier training facility in Houston for advanced systems training in Windows NT, Windows 95, Systems Management Server, and soon Information Exchange. Call 1-800-324-7415 for complete information.

ADVANCED TRAINING/CONSULTANT

Network Services Group, Inc.
8275 Allison Pointe Trail, Suite 375
Indianapolis, Indiana 46250-4207
Phone: (317) 579-5806 Fax: (317) 579-5807
E-Mail: 75361.3151@compuserve.com
NSG is Indy's NT networking leader. The "sales staff" is our team of Microsoft Certified Instructors/Engineers focused on enterprise solutions. Instructors are on-site consultants when not giving ATEC training.

CLIENT/SERVER

Advanced Information Solutions
730 North Franklin, Suite 710
Chicago, IL 60610
Phone: (312) 751-9700 Fax: (312) 751-9053
We are a full-service consulting company, specializing in design, development, and implementing Client/Server enterprise systems. Utilizing Visual Basic, Access, SQL Server, and the Microsoft suite of products, we are Chicagoland's premier provider of custom business solutions.

COROMANDEL INDUSTRIES, INC.
70-15 Austin Street, Third Floor
Forest Hills, NY 11375
Phone: 800-535-3257 Fax: 718-793-9710
Leading developer of Client/Server products like Integra VDB. Services include design and custom development of cross-platform, graphical applications using C++, Visual Basic, Microsoft Office, BackOffice, NT, OLE and SQL databases.

Hummingbird Communications, Ltd.
2500 John Street
Markham, Ontario, Canada L3R 5C3
Phone: (905) 470-1203 Fax: (905) 470-1207
Hummingbird offers the most comprehensive, robust PC X connectivity product line available today. The XcEed product family is comprised of PC X software for Windows, Windows NT, OS/2 and DOS.

Jinks Technology Management, Inc.
2 Tomolonis Dr., Nashua, NH 03062
Phone: (603) 882-8222 Fax: (603) 886-8886
Planning and Development assistance for Windows and Client/Server applications throughout New England. Staff includes Microsoft Certified System Engineer and Product Specialists.

SOLARC (800) 565-0883
Offices in Tulsa & New Orleans
We specialize in developing both departmental and enterprise wide client/server solutions, and provide consulting and training for: Microsoft NT Visual Basic
SQL Server Visual C++

Unibased Systems Architecture, Inc.
14323 So. Outer Forty Rd., Ste. 300 South
St. Louis, MO 63017
Phone: 800-498-5669 Fax: (314) 878-2674
Providing migration of large scale legacy applications to a three tier client/server environment. USA's layered RAD tool (A*SET) provides RDBMS independence, generating standard C code for use with Win 95 and NT server

CONSULTING

Carnegie Technology Group, Inc.
1266 W. Paces Ferry Rd., Suite 508
Atlanta, GA 30327
Phone: (800) 499-7624 Fax: (404) 988-9889
We are recent PhD's from top schools including Carnegie Mellon, MIT, Georgia Tech. We specialize in solving complex problems using Visual C++, Visual Basic, Smalltalk, SQL Server, and ODBC.

Computerart of Georgia, Inc.
7274 Mount Zion Blvd.
Jonesboro, GA 30236
Phone: (800) 987-5105 Phone: (404) 478-5681
Fax: (404) 473-1726
Contract programming, consulting service & software development. Specializing in all industries & most applications. 17 years in business, diverse programming capabilities, multi-platform & a list of satisfied customers.

CoreTech Consulting Group, Inc.
565 East Swedestord Road, Suite 102
Wayne, PA 19087-1611
Phone: (610) 971-0666 Fax: (610) 971-0708
CoreTech is a leading Information Management consulting firm specializing in helping large organizations plan and implement new technologies. We're recognized as experts in managing technology change, while protecting our client's current investments. Skilled in Windows '95, BackOffice suite, MS development tools and MS Applications.

DHS & Associates, Inc.
10255 W. Higgins Rd., Suite 800
Rosemont, IL 60018
Phone: (708) 297-5800 Fax: (708) 297-5607
At DHS & Associates, we design and build practical information systems enabling our clients to anticipate and respond to rapidly changing business environments.

DIS Research Ltd
1500 Broadway, 31st Floor
New York, NY 10036
Phone: (212) 719-9696 Fax: (212) 382-24852
DIS Research is a full service desktop systems integrator serving the business community for the last ten years. With specializations in LAN, WAN design and implementations, systems support and applications development DIS maintains the depth and breadth of services needed to meet all your computing needs.

InterWorks Software, Inc.
1335 Willow Way, Suite 220
Concord, CA 94520
Phone: (510) 671-0810 Fax: (510) 671-4706
Get ready for Windows95! Building on years of cross-platform experience with Fortune 500 companies and the Microsoft Office/BackOffice product suites, we will help you improve system and staff productivity through effective System Management Solutions today and tomorrow.

Navigator
Summerville, CA (408) 744-1760
Colorado (303) 290-0232
Emphasizing Client/Server, messaging and connectivity technologies, Navigator designs, implements, and supports robust LANs/WANs. A service oriented organization, Navigator will be an extension of your IS staff.

NewData Strategies
16415 Addison Road, Suite 500
Dallas, TX 75248
Phone: (214) 735-0001 Fax: (214) 735-8008
NewData Strategies and RDBMS Solutions. NewData Strategies offers Training and Consulting in Microsoft products and major Client/Server and DBMS Tools. We employ Certified PowerBuilder Developers and Microsoft Specialists.

Synaxis Corporation
Contact: Sam Levine (Sam@Synaxis.com)
701-448-4400 FAX 701-448-4401
Technical Competence!
Expert Application Development using Visual Basic. Focus on imaging and E-Mail. Database Analysis, Design, and Development for Access, SQL-Server, and others. Customized Visual Basic Front-ends and Development for Lotus Notes.

Taylor Management Systems, Inc.
2800 River Rd Ste 425
Des Plaines, IL 60018
Phone: (708) 803-1500 Fax: (708) 803-1509
EMAIL: carl@taylorgmt.com
Taylor is among the 25 largest consulting firms in Chicago. As a Microsoft Business Partner, we specialize in Microsoft solutions development, Mainframe to Client-Server conversions and statistical analysis using SAS.

SQLSoft, Inc., 10635 NE 38th Pl., Ste. 248, Kirkland, WA 98033; Phone: (206) 822-1287; fax: (206) 822-1485
VIRTUALLOGIC, Inc.
Phone: (301) 571-9476 Fax: (301) 571-8530
6701 Democracy Blvd., Suite 300
Bethesda, MD 20817-1574
Professionals with the skills you seek — where needed — when needed. On-site developers, DBAs or complete teams skilled in MS development tools, PowerBuilder, MS BackOffice, Sybase and Oracle. Contact Mark Rogers.

CUSTOM SOFTWARE DEV.

InfoDesign Inc.
108 Davenport Lane, Suite 101, Louisville, KY 40223 (502) 339-7144 (voice) (502) 339-7194
Personal P.C. Consultants, Inc. 11026 Prairie Hills Dr., Omaha, NE 68144 Phone: (402) 393-4548; Fax: (402) 392-0711

DATABASE DESIGN/DEV

Professional Computer Solutions, Inc.
383 Northford Place, Suite 100
Englewood, NJ 07631
Phone: (201) 816-8002 Ext. 136 Fax: (201) 816-8113
PCSI focuses on developing database applications using Access, Visual Basic, Paradox, Microsoft SQL Server, Sybase, Oracle, and other products. We also perform technology planning, requirements analysis, architecture, and performance benchmarking.

Quantum Compliance Systems, Inc.
4251 Plymouth Rd.
Ann Arbor, MI 48105
Phone: (313) 761-2152 Fax: (313) 761-3058
Environmental, Health & Safety Information Management Systems to assist with compliance with SARA, RCRA, CAA, TSCA, OSHA, CERCLA, DOT, and other regulatory requirements.

EDUCATION

CheckPOINT 17W240 22nd Street, Oakbrook Terrace, IL 60181. Phone: (708) 279-9030/fax: (708) 279-6359.

END-USER TRAINING

EJI
66 Canal Center Plaza, Suite 200
Alexandria, VA 22314-5507
Phone: (800) 683-5859/(703) 683-0683 Fax: (703) 683-4915
Training, development, and consulting for Microsoft Access, Word, Word, PowerPoint, and Excel. Multimedia development and training for Windows and Mac. Director, Toolbook, Premiere—also Photoshop, CorelDRAW, QuarkXPress, Illustrator, PageMaker, Framemaker.
reSolution, New York area MS ATEC, (212) 255-1956
Get ready NOW for Windows 95, NT 3.5

E-MAIL MANAGEMENT

Baranof Software Inc.
85 School Street
Watertown, MA 02172
Phone: (800) 462-4565 Fax: (617) 926-6636
Leading provider of E-mail Management products, including MailCheck - multivendor graphical console providing end-to-end connectivity checking, error-levels, alerts, statistics, more! Call Kelly Walters for FREE demo!

INDUSTRIAL AUTOMATION

C.B. Engineering Ltd
20, 5920-11 Street SE
Calgary, Alberta, Canada T2H 2M4
Phone: (403) 259-6220 Fax: (403) 259-3377
CB Engineering represents industrial automation suppliers which include Intellution, Inc. (SCADA/MMI software) and IBM (Industrial Computers, Monitors, and Data Collection Units). Located in seven major Canadian cities, call 1-800-99CBENG (1-800-992-9364).

LINE/BUSINESS SOLUTIONS

Granitek Systems, Inc.
Meridith Sq. #10
169 Rt. 3, Daniel Webster Hwy.
Meridith, NH 03253
Phone: (603) 279-1200 Fax: (603) 279-1201
SALES PARTNER - Integrated Sales and Prospect Management in Microsoft Access for Windows or Windows NT. Sales Force Automation with links to Word, Excel, Great Plains, Dynamics and Micro-Max MRP.

Information Processing Corporation
5930 LBJ Freeway, Suite 300
Dallas, TX 75240
Phone: 1-800-IPC-FICS Fax: (214) 404-9287
IPC's products are: ABADUS, provides billing and resource utilization management for data processing centers; FICS, a relationship banking solution for financial institutions; Visual Security System, a security product for developers.

JMJ Technologies, Inc.
Phone: (404) 509-5653/(800) 677-5653 Fax: (404) 973-8194
Quality client/server solutions using OO technology. Us include PowerBuilder, VB, C++, DBMSs include SQL Server, Sybase, Ingres, Access. Solutions glued with OLE, ODBC, BDE, Wireless LANs, Remote Access.

Micro-Frame Technologies, Inc.
430 N. Vineyard, Suite 102
Ontario, California 91764
Phone: (909) 338-2711 Fax: (909) 984-5382
ProjectServer converts Microsoft Project into a client/server solution for managing multiple projects. Features multi-project task updating with automatic posting to Project; on-line status reports; action item tracking; automated file uploading; and timesheets.

SQL Financials
20 Ravinia Drive, Suite 1000
Atlanta, GA 30346
Phone: (404) 390-3900 Fax: (404) 390-3999
SQL Financials develops and support cross-industry client/server financial applications for a wide range of environments. These high performance applications are fully functional, intuitive, quick to implement and provide a rapid return on customer investment.

SYSTEMS INTEGRATION

Corporate Software Inc.
2 Edgewater Dr.
Norwood, MA 02062
Phone: (617) 440-1170 Fax: (617) 440-7083
International provider of microcomputer software, support and systems integration services for businesses and institutions. Services include software support, technical training, pilot implementations, consulting, software integration and migration management.

EDM Inc. 4075 Papazian Way, Ste 205, Fremont, CA 94538 (510) 438-9651 - VB, NT, SQL, PowerBldr., Conversions, Imaging.

G.A. Parks Consulting Group, Inc.
342 Madison Avenue, Suite 1430
New York, NY 10173
Phone: (212) 286-0777
Improve your existing investment. WFW, NT, Access, hardware, sales, support, service, design, full help desk support.

Indus Consultancy Services

140 E Ridgewood Ave
Paramus, NJ 07652
Phone: (201) 261-3100 Fax: (201) 261-1399
Indus Consultancy Services (ICS), the systems integrator of choice, will help you implement Distributed Databases, Client/Server, GUI and OO Systems. ICS specializes in Microsoft Windows NT, SQL Server, SMS, Access and Visual C++.

LANSystems Inc. - (800) ASK.4.LAN

Network Six, Inc.
475 Kilvert Street
Warwick, RI 02886
Phone: (401) 732-9000 Fax: (401) 732-9009
Providing systems integration services to government human services agencies, using information technology - including project management, systems design, software development, hardware procurement/installation, training, and data conversion.

Random Access, Inc.
8000 East 10th Avenue
Denver, CO 80231
Phone: (303) 745-9600 Fax: (303) 745-0242
Random Access is a leading provider of information technology solutions. Headquartered in Denver, Random Access has branch offices in Colorado Springs and Boulder, Seattle, Portland, Phoenix, Salt Lake City, Boise, Houston, Omaha and Minneapolis.

Systems Research and Applications Corporation
2000 15th St.,
No Arlington, VA 22201

SRP provides solutions for industry and government. Specific markets include health, manufacturing, legal and retail, with expertise in integration, telecommunications, networks, imaging, multimedia, full text document management, and business reengineering.

Tech-Comm, Inc. LAN-MAN Network Experts
Birmingham, AL (205) 250-8053

SYSTEMS INTEGRATION/MESSAGING

Wordlink
2009 Fox Drive
Champaign, IL 61820
Phone: (217) 359-9378 Fax: (217) 373-6279
WORDLINK offers of complete set of networking, information integration and authorized education services designed for Microsoft solutions. WORDLINK has locations in Illinois, Indianapolis, Missouri and California.

TECHNICAL TRAINING

Digital Equipment Corporation
129 Parker Street
Maynard, MA 01754
Phone: (800) 332-5656 Fax: (603) 884-6655
Come to us for a complete turnkey solution that includes registration, scheduling, and accounting, as well as course development delivery and testing. It's training at its best-in your best interest.

Meliora Systems, Inc.
95 Allens Creek Road, Building 2, Suite 302
Rochester, NY 14618
Phone: (716) 461-1900 Fax: (716) 461-1989, E-Mail: 70742.3173@compuserve.com
As one of the country's premier Microsoft Solution Provider Partners and Authorized Technical Education Centers, Meliora Systems is a leading provider of consulting and training on Microsoft Office and BackOffice.

RTIC, Inc.
1-800-476-4454/Fax: 804-295-3291
Authorized Technical Education Center (ATEC), Microsoft certified training for support professionals. Washington, D.C. and Richmond, Virginia. On-site training available. Classes in NT, Server, SQL, SMS, Windows 95, Mail. Serving Customers Nationwide

TRAINING

Computer Savvy, Inc., 2382 W Oakland Park Blvd., Ft. Lauderdale, FL 33311 Phone: (305) 486-0644; Fax: (305) 486-5659; PC Training Network Certification

Keystone Learning Systems Corp.
2181 Larsen Parkway
Pomona, UT 84606
PH: 800-748-4838, 04 801-375-8680 Fax: 801-373-6872
We specialize in Video Training for your Entire Enterprise. Courses available for MS Office, VisualBasic, Project, Back Office, Windows and many more. Call today to start your Video Training Library.

MSU, Windows Training & Development Center
Houston, TX (713) 650-0333 Fax: (713) 650-0660.

WORKGROUP AUTOMATION

Kols & Associates, Inc
156 Fifth Avenue
New York, NY 10010
Phone: (212) 255-1956 Fax: (212) 255-1735
Specialists in workgroup automation & customization with all favors of Windows (Workgroups, NT), MS apps (Word, Excel, Access, Mail), & MS BASICs (VB, WordBasic, VBA).

Editorial Index

Companies in this issue

Page number refers to page on which story begins

3Com Corp. 2,8

A

Aberdeen Group, Inc. 53-54
 Allegheny Ludlum Corp. 4
 Alliance & Leicester Building Society 81
 Amdahl Corp. 2
 America Online, Inc. 8
 American Airlines 16
 American National Standards Institute 75
 American Software, Inc. 76
 Ampro Canada Corp. 88
 Anytime Computing Ltd. 72
 Aon Specialty Group 43
 Apple Computer, Inc. 4
 Cover 1, 14, 20, 24, 49, 76
 Arcata Software, Inc. 24
 ARDIS Co. 6
 Asante Technologies, Inc. 49
 Astoria Federal Savings 43
 AT&T Bell Laboratories 75
 AT&T Corp. 60
 AT&T Global Information Solutions Cover 1
 Atlantis Scientific Systems, Inc. 75
 Auspex Systems, Inc. 53
 Autotire Corp. 43

B

Bank of America 60
 Bankers Trust Co. 4
 Banyan Systems, Inc. 20
 Baxter Health Care 81
 Bay Networks, Inc. 2
 Bell Sygma, Inc. 2
 Bellcorp 8
 BIS Strategic Decisions, Inc. 6
 Blue Cross and Blue Shield 64
 Boyle & Babbage, Inc. 2
 Borland International, Inc. 2
 Cover 1, 75
 Buck Consultants, Inc. 4

C

Cabletron Systems, Inc. 2
 Cover 1, 2, 8
 Cadre Technologies, Inc. 76
 Cammaro Research 54
 Campbell Soup Co. 73
 Centillion Networks, Inc. 2
 Chevron Information Technology Co. 54
 Chrysler Financial Corp. 75
 Cigna Corp. 53
 CIMI Corp. 15-59
 Circulus Strategies 28
 Cisco Systems, Inc. 2, 4, 2
 Citicorp NA 14
 CNN 8
 Columbia/HCA Healthcare Corp. Cover 1

Communications Network

Architects, Inc. 28
 Compaq 6, 8, 32, 43, 53
 Computer Corp. 12
 Computer & Communications Industry Association 32
 Computer Associates International, Inc. 8
 Computer Integrator 16
 Computron Software, Inc. 90
 Connecticut Mutual Life Insurance Co. 43-69
 Convex Computer Corp. 69
 Coopers & Lybrand 114
 Cranel, Inc. 72
 Cray Research, Inc. 69
 Crystal Computer Services, Inc. 57
 CS First Boston 53

D

Data General Corp. 72, 73
 Datapoint Information Services, Inc. 60
 David Clark Co. 6
 Davidson Consulting 54
 Decis, Inc. 4
 Dell Computer Corp. 6, 8, 43
 Deloitte & Touche Cover 1
 Devon Consulting 103
 Diamond Shamrock, Inc. 114
 Digital Equipment Corp. Cover 1, 6, 8, 32, 69, 72, 81
 Digitool, Inc. 49
 DiskTrend, Inc. 32
 Ditec Information Technology GmbH & Co. KG 81
 Dun & Bradstreet Software 88, 93

E

E. W. Blanch, Inc. 114
 Eastman Kodak Co. 73
 Egghead Discount Software 12
 Electronic Freedom Frontier 81
 Encore Consulting Group 6
 Eurogroup 81
 Exxon Corp. 90
 FileNet Corp. 90
 Financial Services Technology Consortium 8
 Firestone Textiles 53
 Fleet Mortgage Group 28

F

Fluke Corp. 77
 Ford Motor Co. Cover 1
 Franz, Inc. 76
 FreeMail, Inc. 57
 Fujitsu, Inc. 2
 Gartner Group, Inc. 2, 43, 60, 76
 Gateway 2000, Inc. 6, 8, 43
 General Electric Co. 90
 General Services Administration 2, 59
 Geoworks 6
 Griffith & Associates 60
 Hale & Dorr 15
 Hewlett-Packard Co. 6, 8, 16, 28, 32, 53, 54, 69, 72, 75, 76, 77, 88
 High Tech Center 69
 Hitachi Data Systems Corp. 2
 Hitachi Ltd. 60
 Huntington Bancshares, Inc. 60

I

IBM 2, 4, 6, 8, 10, 12, 16, 69, 72, 73, 76, 88, 97
 ICL 54
 Illuminata 73
 Illustra Information Technologies, Inc. 76
 Ing. C. Olivetti & Co. 81
 Input, Inc. 16
 Integrated Systems Solutions Corp. 73
 Intel Corp. 6, 8, 53
 IntelCom Solutions, Inc. 8
 Intergraph Corp. 54
 International Data Corp. 28, 43, 73, 75, 88
 International Shipholding Corp. 88
 Internet Society 59
 IPC Magazines 81
 Ipswitch, Inc. 8
 Kawasaki Steel Corp. 82
 Keane, Inc. Cover 1
 Kinko's 69
 Kraft General Foods, Inc. 90

K

Langsfeld Fazio & Associate 16
 Lawson Software, Inc. 88
 Legent Corp. 8

L

Link Resources, Inc. 15
 Linksys 49
 Lockheed Martin 14
 Missile and Space 14
 Lotus Development Corp. 54, 97
 Lysis Corp. 72

M

Mazda 97
 MCI Corp. 60
 MCI Telecommunications Corp. 10
 Memory Technologies Group 6
 Mental Images Software 69
 Meta Group, Inc. 2, 4, 97
 MFS Communications Co. 15
 MFS Datanet, Inc. 15
 Micro Focus, Inc. 76
 Microsoft Corp. 4, 8, 14, 24, 28, 32, 43, 49, 53, 54, 57, 60, 69, 72, 75, 77, 97
 Montgomery Securities 8
 Motorola, Inc. 6

N

NASA Goddard Space Flight Center 32
 National Computer Security Association 8
 National Steel Corp. 73
 NationsBank Capital Markets, Inc. 53
 NEC Technologies, Inc. 44
 NetManage, Inc. 76
 Netscape Communications Corp. 8, 121
 NetSoft 72
 Network Computing Devices, Inc. 8
 Next Computer, Inc. 75
 Northeast Consulting Resources, Inc. 53
 Northwest Airlines 16
 Novell, Inc. 2, 4, 12, 20, 53, 54, 57, 59, 64

O

Open Software Foundation 8, 10
 Oracle Corp. 4, 8, 53, 73, 75, 93
 Owens-Corning Fiberglas Corp. Cover 1

P

Pacific Bell 64
 Palindrome Corp. 28
 Parcorp-Digital, Inc. 75

Peoplesoft, Inc.

Peoplesoft, Inc. 88, 93
 Perot Systems Corp. 81
 Personal Computer Assets Management Institute, Inc. 53
 Phillips Petroleum Co. 30
 Pizza Hut, Inc. 90
 Portrait Display Labs, Inc. 49
 Power Computer Corp. 49
 Powersoft Corp. 76
 PRC Corp. 88
 Procter & Gamble Co. 8

R

Radius, Inc. 49
 Recognition International, Inc. 90
 Reply Corp. 43
 Richardson Electronics, Inc. 73

S

Sabre Travel Information Network 16, 73
 Sage Research, Inc. 28
 SAP AG 73
 SAP America, Inc. 93
 SAS Institute, Inc. 49
 Satum Corp. Cover 1
 Scientific and Engineering Software, Inc. 77
 Scopus Technology, Inc. 57
 Segue Software, Inc. 77
 Shadow Enterprise 24
 Share, Inc. 69
 SHL Systemhouse, Inc. 73
 Showtime Cover 1
 Siemens Cover 1
 Softmark, Inc. Cover 1
 SoftTracks Cover 1
 Software AG of North America, Inc. 76
 Software Artistry, Inc. 57
 Sprint Corp. 8, 28
 Spryglass, Inc. 75
 SQL Financials International, Inc. 114
 Staffware Corp. 53
 Staples 12
 Starfish Software Cover 1
 Stone Container Corp. 53
 Stream International, Inc. Cover 1
 Summit Strategies, Inc. 8
 Sun Microsystems, Inc. 28, 53, 54, 72, 77
 Swiss Bank Corp. 53
 Sybase, Inc. 54
 Symantec Corp. 75
 SynOptics Communications, Inc. 2
 System Software

T

Taligent, Inc. 4, 76
 Tandem Computers, Inc. 76
 Tandy Corp. 12
 TeamWare, Inc. 54
 TeleChoice, Inc. Cover 1
 Terabank Systems, Inc. 32
 Texas Instruments, Inc. 77
 The Boeing Co. 90
 The Dow Chemical Co. Cover 1
 The Goodyear Tire & Rubber Co. 90
 The Incredible Universe 12
 The Santa Cruz Operation 16
 The Seattle Times 114
 The Smoby Group 69
 The Standish Group International, Inc. 69
 The Tower Group 60
 The Yankee Group 15
 Tivoli Systems Corp. 28
 Tricord Corp. 8
 TV Guide 53

U

U.S. Department of Commerce 32
 Unisys Corp. Cover 1

V

Valtek, Inc. 88
 Viewstar Corp. 53, 90
 Visa International, Inc. 60
 Visual Edge Software Ltd. 4
 VSR Financial Services 121

W

Wang Laboratories, Inc. 90
 Warner Brothers Interactive Entertainment 8
 Washington Systems Consulting, Inc. 32
 Wellfleet Communications, Inc. Cover 1
 WorkGroup Technologies, Inc. 8, 43, 44

X

XSoft, Inc. 53

Z

Zycad Corp. 121

Contacting CW Editors

CONTACTING US BY PHONE

All editors can be contacted at our main phone number, (508) 879-0700, unless otherwise noted below. Our 24-hour news tip line is (508) 820-8179. For subscriptions, call (800) 669-1002, back issues, call (508) 820-8129, reprints, call (508) 820-8125.

Our main fax number is (508) 879-8931.

CONTACTING US BY E-MAIL

All of our staff members can be reached via E-mail on the Internet using the form firstname.lastname@cw.com.

Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

Our **CompuServe** address is 76537.243 for editorial correspondence only. Direct subscription inquiries to CompuServe: 73373.1230.

Respond to your **Talkback** inquiries at talkback@cw.com.

CONTACTING CW EDITORS

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor in Chief Bill Laberis (508) 620-7728
 Editor Paul Gillin (508) 620-7724

DEPARTMENT EDITORS/NEWS

News Editor Maryfran Johnson (508) 820-8179
 Sections Editor Johanna Ambrosio (508) 820-8553
 Assistant News Editor Patricia Keele (508) 820-8187
 Assistant Sections Editor Michael Fitzgerald (508) 820-8206

SENIOR EDITORS/NEWS

Government and security news Gary H. Anthes (202) 347-0134
 Social and legal news Mitch Betts (202) 347-6718

HP, open systems

Local-area networks Network management PC applications software Application development New York area vendors and users Microsoft systems software Client/server applications software Storage management Internet/on-line services Apple and OS/2 IBM large systems and software Networking

SENIOR WRITERS/NEWS

Mobile computing DEC, most midrange hardware Groupware, E-mail PC hardware Telecommunications, Unisys

STAFF WRITERS/NEWS

Imaging, multimedia New Products Writer

OPINIONS/VIEWPOINT

Technical Editor Charles Babcock (415) 548-5512
 Viewpoint Editor Mitch Betts (202) 347-6718

DEPARTMENT EDITORS/FEATURES

Technology Evaluations/CW Guide James Connolly (508) 820-8144

SENIOR EDITORS/FEATURES

Management In Depth Joseph Maglitta (508) 820-8192
 Re-engineering/ corporate strategies Jodie Nease (508) 820-7727
 Careers, Marketplace sections Allan E. Alter (508) 820-8115
 Lory Zoltick (508) 820-8236
 Kathleen Gow (508) 820-8236

ASSOCIATE EDITORS/FEATURES

Management David B. Weidon (508) 820-8166
 CW Guide Cathleen Gagne (508) 620-7729

RESEARCH

Bob Fink, senior research manager (508) 810-8166; Kevin Burden, senior researcher; Laura Hunt, research analyst; Amy Mallory, intern; Stefanie McCann, graphics coordinator.

SPECIAL PROJECTS, SUPPLEMENTAL PUBLICATIONS

(Including Premier 100, Global 100, Best Places to Work, Campus edition, Leadership Series and Salary Survey)
 Bruce Rayner, special projects editor (508) 820-8195; Joyce Chutchan-Ferranti, managing editor.

COPY DESK

Anne McCrory, chief copy editor (508) 820-8205; Christina Aicardi Maguire, assistant chief copy editor; Ellen Fanning, Michelle J. Keyo, senior copy editors; Roberta A. Fusaro, Kimberly Gilliard, Michelle Grabon, Jay F. Rizoli, copy editors.

GRAPHIC DESIGN

Tom Monahan, design director (508) 820-8218; Janell Genovesi, Mitchell J. Hayes, Nancy Kowal, senior graphic designers; David Waugh, Mary Beth Welch, graphic designers; Rich Tennant, cartoonist.

ADMINISTRATIVE SUPPORT

Linda Gorgone, office manager (508) 820-8176; Connie Brown, Aleksandra Skube, Lorraine Witzell, editorial assistants; Chris Flanagan, West Coast editorial assistant, (415) 548-5563.

COMPUTERWORLD CLIENT/SERVER JOURNAL

Alan Alper, editor (508) 820-8115; Catherine McCrory, managing editor; Mary Brandel, senior editor; Kimberlee A. Smith, copy editor; Stephanie Faucher, graphic designer.

Gainers Losers

Percent

SYSTEM SOFTWARE ASSOC. (H)	29.4	DATA RACE INC.	-27.6
TRICORD SYSTEMS	25.9	INTELLIGENT ELECTRONICS	-25.7
RASTEROPS (H)	25.0	RECON INC.	-18.9
RACOTEK INC.	17.6	IPL SYSTEMS INC.	-17.4
MAXTOR CORP.	12.0	EMULEX CORP.	-17.2
PACIFIC SYSTEMS INC.	11.7	RADIUS INC.	-15.2
CENTIGRAM COMMUNICATIONS	10.7	NOVELL INC.	-13.7
CROSSCOM	10.3	PLATINUM SOFTWARE	-13.6

Dollar

SYSTEM SOFTWARE ASSOC. (H)	7.88	US ROBOTICS (H)	-15.75
CIRUS LOGIC (H)	3.00	IBM (H)	-8.25
TANDY CORP. (H)	2.75	CYPRESS SEMICONDUCTOR CORP. (H)	-6.00
CERIBOND CORP.	2.63	INTEL CORP.	-5.50
ITT CORP.	2.50	PEOPLESORT	-5.00
NETWORK EQUIPMENT TECH. (H)	2.50	COMPUTER CORP. (H)	-4.63
AT&T	2.38	EMULEX CORP.	-4.63
PLATINUM TECHNOLOGY	2.25	HEWLETT PACKARD CO. (H)	-4.50

A SLEW OF TECHNOLOGY STOCKS, INCLUDING MICROSOFT CORP., MARKED WINDOWS 95'S GRAND ENTRANCE BY LOSING GROUND LAST WEEK. INVESTORS DECIDED TO CASH IN THEIR HIGH-FLYING TECH STOCKS BEFORE UNCERTAINTY ABOUT WINDOWS 95'S SALES SET IN, ANALYSTS SAID.

The next big (or small) thing

While investors in the big computer companies have been reaping millions from Wall Street's most recent love affair with technology, they aren't the only game in town.

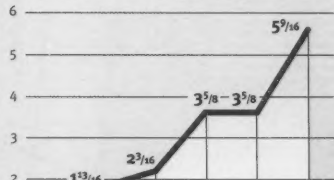
Smaller, more growth-oriented technology stocks may be the next prize for investors, according to one stock market watcher. Rick Chehab, an analyst at VSR Financial Services in San Jose, Calif., came to that conclusion after he tracked the ratio of the Russell 2000 small stocks index with the Russell 1000 large stock index.

The ratio has been moving up steadily since bottoming out in July, Chehab said, meaning "the movement is in the smaller stocks, or else the big stocks are decreasing." One stock he singled out is Zycad Corp. (ZCAD), a Fremont, Calif., chip maker that has pioneered a combined emulation and simulation technology that is important for testing the strength of computer chips.

Another analyst said he sees most PC-related stocks going into a quiet period as users evaluate Microsoft Corp.'s Windows 95 and make new buying decisions. Mike Murphy, editor of "California Technology Stock Letter" in Half Moon Bay, Calif., said client/server software firms and relational database companies could see a little more growth as a result. And though Zycad is in the chip segment, "they will do all right because they have a new product ramping up" as well as a recent \$3 million contract with the Department of Defense's Advanced Research Products Agency, Murphy said. —Tim Ouellette

Immune...

While Zycad's stock price may look dormant, the small stock, and others like it, could ride a second wave of technology investment behind the big names on Wall Street



52-WK RANGE		Aug. 25 Wk Ht		52-WK RANGE		Aug. 25 Wk Ht									
GE	CHANGE	3 PM	CLOSE	CHANG	GE	CHANGE	3 PM								
Communications and Network Services															
		UP +0.5%													
OTC	81.63	30.25	3COM CORP. (H)	79.25	-1.38	-1.7	OTC	16.50	6.75	MANUAGISTICS GROUP INC.	15.75	0.50	3.3		
NYS	59.38	38.00	AMERITECH CORP. (H)	49.63	0.63	1.3	OTC	40.00	16.00	MARINER CORP.	21.25	2.25	9.6		
NYS	59.00	47.25	AT&T	54.63	2.38	4.5	OTC	7.38	1.88	MATHSOFT	6.88	0.31	4.8		
NYS	74.75	10.38	ASCEND COMMUNICATIONS	65.00	-1.00	-1.5	OTC	45.25	8.00	MCFAE ASSOCIATES	45.13	2.13	4.9		
OTC	19.75	10.00	BANYAN SYSTEMS INC.	10.75	-0.50	-4.4	OTC	19.88	9.75	MENTOR GRAPHICS	18.88	0.19	1.0		
OTC	49.38	23.13	BAY NETWORKS INC. (H)	46.38	-2.88	-5.8	OTC	22.50	8.50	NETMANAGE INC.	19.88	0.13	0.6		
NYS	59.75	48.38	BELL ATLANTIC CORP.	58.63	0.63	1.1	OTC	11.38	5.00	MICROGRAPHIC INC. (H)	10.75	0.75	7.5		
NYS	69.00	50.50	BELLSOUTH CORP.	67.13	1.00	1.5	OTC	109.25	53.88	MICROSOFT CORP.	95.38	2.63	2.7		
NYS	39.38	12.63	BOLY, BIRNBAUM & NEWMAN	35.50	0.88	2.5	OTC	44.38	24.75	NETSCAPE COMM. CORP.	39.38	0.75	1.9		
NYS	22.25	9.00	BROOKTRUST TECHNOLOGY	20.00	-0.75	-3.6	OTC	24.28	7.88	ORACLE CORP. (H)	42.75	0.00	0.0		
NYS	59.63	37.38	CABLETRON SYSTEMS	54.13	-2.00	-3.6	OTC	76.50	21.00	PARAMETRIC TECHNOLOGY	15.75	1.75	12.0		
OTC	22.25	12.25	CENTIGRAM COMMUNICATIONS	18.13	-1.75	-10.7	OTC	12.88	5.00	PEOPLESORT	46.75	5.00	10.6		
NYS	50.50	20.00	CHIPCOM CORP.	40.75	-0.88	-2.1	OTC	16.88	6.38	PLATINUM SOFTWARE	12.75	-2.00	-13.6		
OTC	67.00	23.00	CISCO SYSTEMS INC. (H)	64.25	-1.88	-2.8	OTC	25.25	13.50	PLATINUM TECHNOLOGY	24.00	2.25	10.3		
OTC	11.63	6.13	COMPRESSION LABS INC.	8.38	0.63	8.1	OTC	26.75	10.75	PROGRESS SOFTWARE CORP.	53.75	-4.50	-7.7		
OTC	12.75	5.63	COMPUTER NETWORK TECH.	9.00	0.38	4.3	OTC	17.50	1.94	QUARTERDECK CORP.	15.38	-0.50	-3.1		
OTC	14.50	7.50	CROSSCOM	12.00	1.13	10.3	OTC	48.00	12.50	RANBOW TECHNOLOGIES INC.	8.75	1.75	25.0		
OTC	4.50	2.13	DATA SWITZER CORP.	0.31	0.00	0.0	OTC	7.75	3.00	ROSS SYSTEMS (H)	6.75	-0.25	-3.6		
OTC	55.50	23.63	DSC COMMUNICATIONS	54.63	1.25	2.3	OTC	6.25	2.88	SOFTWARE PUBLISHING CORP.	4.13	0.31	8.2		
OTC	42.00	15.75	FORE SYSTEMS INC.	32.50	-3.13	-8.8	OTC	12.50	5.25	STATE OF ARIZ.	8.75	-0.25	-2.8		
NYS	35.88	9.25	GENERAL DATA COMM. INDUS.	12.25	-0.50	-3.9	OTC	47.50	28.13	STERLING SOFTWARE INC. (H)	46.38	0.13	0.3		
OTC	36.38	29.50	GTE CORP.	36.00	0.25	0.7	OTC	16.75	4.63	STRUCT. DYNAMICS RESEARCH (H)	16.38	0.75	4.8		
NYS	121.88	77.00	ITT CORP.	120.63	2.50	2.1	OTC	55.00	19.88	SYBASE INC.	32.38	-1.63	-4.8		
OTC	29.88	17.25	MCI COMMUNICATIONS CORP.	23.25	-0.38	-1.6	OTC	12.38	11.63	SYMANTEC CORP.	39.75	3.88	9.8		
OTC	15.75	5.50	MICOM COMMUNICATIONS CORP.	7.88	0.13	1.6	OTC	67.25	39.50	SynOpsys	61.00	-1.25	-2.0		
OTC	22.25	6.63	MICROCOM INC.	19.25	-0.75	-3.8	OTC	36.88	10.63	SYSTEM SOFTWARE ASSOC. (H)	34.63	7.88	29.4		
OTC	10.50	4.00	NETRIX CORP.	9.25	0.38	7.7	OTC	8.13	5.50	SYSTEMS INC.	32.38	-1.75	-7.4		
OTC	12.00	3.25	NETWORK COMPUTING DEVICES	8.75	-0.69	-7.3	OTC	8.13	3.25	TRINITEC CORP.	7.75	0.50	6.9		
NYS	35.50	12.13	NETWORK EQUIPMENT TECH. (H)	35.50	2.50	7.6	OTC	18.13	5.50	SYSTEMS INC.	32.38	-1.75	-7.4		
OTC	36.13	17.13	NORTH GENEAL CORP.	33.38	1.00	3.1	OTC	18.13	5.50	SYSTEMS INC.	32.38	-1.75	-7.4		
OTC	43.38	27.00	NEWBRIDGE NETWORKS CORP.	29.75	-0.13	-0.4	OTC	10.00	10.75	VIRAGE SOFTWARE INC.	10.00	0.00	0.0		
OTC	41.00	31.25	NORTHEAST TELECOM LTD.	36.38	-3.38	-10.7	OTC	24.00	7.88	VIEWLOGIC SYSTEMS	12.50	0.63	5.1		
OTC	25.25	14.13	NOVELL INC.	24.75	-0.88	-3.7	OTC	22.00	10.75	VIRAGE SOFTWARE INC.	10.00	0.00	0.0		
OTC	45.13	35.63	NYNEX CORP.	44.63	0.00	0.0	OTC	10.75	4.63	WALKER INTERACTIVE SYSTEMS	6.94	0.44	6.7		
OTC	39.25	17.75	OCTEL COMMUNICATIONS CORP.	36.63	-0.25	-0.7	OTC	55.50	15.00	WALL DATA INC.	18.75	-0.25	-1.3		
OTC	33.25	8.13	OPTICAL DATA SYSTEMS INC. (H)	33.00	2.00	6.1	OTC	19.50	9.13	WANG LABORATORIES INC.	18.00	0.25	1.4		
OTC	7.13	2.13	PENRIL DATA COMM NETWORKS (H)	6.75	0.13	1.9									
OTC	62.00	14.75	PICTURETEL CORP.	54.25	-2.25	-4.0									
OTC	8.13	2.75	PROTEON INC.	6.50	0.00	0.0									
OTC	7.88	3.00	RACOTEK INC.	6.25	0.94	17.6									
OTC	2.75	3.50	RETEX	3.94	0.06	1.6									
NYS	24.88	17.50	SCIENTIFIC ATLANTA INC.	21.75	0.75	3.6									
OTC	50.13	39.25	SOUTHWESTERN BELL CORP.	49.13	0.63	1.3									
NYS	40.13	25.88	SPRINT CORP. (H)	34.50	0.25	0.7									
OTC	31.63	12.50	STANDARD MICROSYSTEMS CORP.	16.75	-0.88	-5.0									
OTC	57.50	17.38	STRATACOM INC.	50.75	-1.50	-6.5									
OTC	41.13	3.63	TELECOM CORP. (H)	40.00	0.13	0.3									
OTC	161.75	30.75	US ROBOTICS (H)	144.75	-15.75	-9.8									
OTC	45.00	29.63	US WEST INC.	43.00	0.00	0.0									
OTC	50.13	9.13	XYROCOM	42.13	-0.38	-0.9									
OTC	38.25	10.00	XYLOGICS INC.	36.50	-1.25	-3.3									
Semiconductors															
NYS	39.25	22.25	ADVANCED MICRO DEVICES	33.25	-2.13	-6.0									
NYS	19.50	19.63	ANALOG DEVICES INC.	35.13	-1.38	-3.8									
OTC	36.75	13.25	ATMEL CORP. (H)	32.38	-2.75	-7.8									
OTC	15.50	3.88	CHIPS AND TECHNOLOGIES	13.13	-0.75	-5.4									
OTC	55.50	15.00	CYPRESS SEMICONDUCTOR CORP. (H)	48.88	-6.00	-10.9									
OTC	24.88	13.38	DALLAS SEMICONDUCTOR	23.88	-1.5	-6.3									
OTC	23.50	6.13	INTEGRATED SILICON SYSTEMS	29.75	-5.50	-18.4									
OTC	78.38	28.75	INTEL CORP.	59.75	-5.00	-8.4									
OTC	53.00	14.75	LSI LOGIC CORP. (H)	50.50	-5.00	-10.0									
OTC	43.00	15.50	LATTICE SEMICONDUCTOR	42.75	-0.25	-0.6									
OTC	75.38	15.25	MICRON TECHNOLOGY (H)	72.88	1.88	2.6									
OTC	80.13	49.00	MOTOROLA INC.	73.00	-4.25	-5.5									
NYS	31.25	14.38	NATIONAL SEMICONDUCTOR	28.00	-0.75	-2.4									
OTC	76.25	10.50	SIEMENS SEMICONDUCTOR	49.38	-2.38	-4.6									
OTC	82.13	37.13	TEXAS INSTRUMENTS (H)	75.13	-4.19	-5.3									
OTC	5.25	1.78	WEITEK	4.00	0.00	0.0									
OTC	22.13	13.13	WESTERN DIGITAL CORP. (H)	20.75	-0.63	-2.9									
OTC	54.13	37.38	ZILOG INC.	45.63	-0.13	-0.3									
Peripherals and Subsystems															
		UP +0.1%													
OTC	25.88	14.38	AMERICAN POWER CONVERSION	16.50	-0.81	-4.7									
OTC	27.25	14.75	ADAPTEC INC.	42.50	0.00	0.0									
OTC	27.25	14.75	BANCTEC INC.	17.50	-0.44	-2.4									
OTC	13.13	3.38	CAMBER CORP.	11.88	-0.13	-1.0									
ASE	6.38	1.38	CONTRONICS CORP.	5.63	0.13	2.3									
NYS	14.63	9.00	CONNER PERIPHERALS	13.63	-0.25	-1.8									
OTC	6.63	5.88	CREATIVE TECHNOLOGIES INC.	11.25	-0.38	-3.2									
OTC	13.13	3.00	DATA RATE INC.	7.25	-0.50	-12.6									
ASE	8.50	4.25	DATACORP INC.	8.00	-0.19	-2.3									
OTC	22.13	13.13	DATARAM CORP.	11.88	-0.38	-3.2									
OTC	28.50	8.00	EMULEX CORP.	22.25	-4.63	-17.2									
OTC	19.00	11.25	EVANS & SUTHERLAND	18.13	0.13	0.7									
OTC	24.00	11.75	EXARTE	15.94	-0.44	-2.7									
OTC	4.75	1.88	INTELLIGENT INC.	3.31	-0.13	-3.6									
OTC	30.00	2.38	IONEGA CORP.	25.25	-2.19	-8.0									
OTC	12.88	2.00	IPR SYSTEMS INC.	65.00	-1.13	-1.7									
OTC	69.63	22.00	KOMAG INC.	5.25	0.56	10.2									
OTC	7.25	2.63	MATROX CORP.	5.25	0.56	10.2									
OTC	12.25	0.25	MCSE CORP.</td <td>11.88</td> <td>-0.13</td> <td>-1.0</td> <td colspan="8"></td>	11.88	-0.13	-1.0									
OTC	23.75	8.75	PINNACLE MICRO INC.	21.63	-1.41	-6.3									
OTC	38.75	10.13	PRINTHORN INC.	30.75	2.00	7.0									
OTC	17.50	1.50	QMS INC. (H)	16.25	-0.25	-1.3									
OTC	28.00	13.75	QUANTUM CORP. (H)	25.38	-2.13	-7.7									
OTC	15.00	7.00	RADISIN INC.	7.00	-1.25	-15.2									
OTC	13.38	1.38	REDUCTION INTERNATIONAL	10.88	-0.44	-3.9									
OTC	7.00	1.38	REXION INC.	1.88	-0.44	-18.9									
OTC	49.38	22.88	SEAGATE TECHNOLOGY (H)	46.88	-2.25	-4.6									
OTC	52.38	11.38	STORAGE TECHNOLOGY	45.75	-2.75	-5.7									
OTC	52.38	11.31	TEXTRONIX INC.	45.75	-2.75	-5.7									
NYS	128.38	90.63	XEROX CORP. (H)	123.50	-5.00	-3.9									
Services															
		UP +0.3%													
OTC	27.00	14.38	AMERICAN MGMT. SYSTEMS	25.13	0.75	3.1									
OTC	31.13	14.75	ANAPAC INC.	31.00	0.75	2.1									
OTC	30.10	14.75	ANALYSTS INT'L (H)	31.00	0.75	2.1									
OTC	40.00	14.75	ANALYSTS PROCESSING	31.00	0.75	2.1									
OTC	40.00	14.75	CAMBRIDGE TECH. PARTNERS	38.50	-3.50	-10.0									
OTC	45.13	23.50	CERBERUS CORP.	41.53	2.63	6.2									
OTC	19.38	19.38	CHARTER SYSTEMS	19.38	0.75	3.7									
OTC	21.00	6.63	COMPUTER HORIZONS	20.00	-1.03	-6.6									
OTC	61.50	41.00	COMPUTER SCIENCES	60.50	0.75	1.3									
OTC	7.50	3.25	COMPUTER TASK GROUP	7.50	0.25	3.3									
NYS	28.75	6.88	COMPU\$ING INC.	36.88	0.25	0.7									
OTC	10.75	5.38	CONTROL DATA SYSTEMS	9.63	0.25	2.7									
OTC	45.00	22.50	EQUINOX DISCOUNT SOFTWARE	42.50	-2.50	-5.6									
OTC	40.50	34.75	EDGEWARE SYSTEMS (EDS)	46.13	0.38	0.8									
OTC	15.25	6.88	INACOM CORP.	13.00	-0.75	-5.5									
OTC	7.50	3.25	INTELLIGENT ELECTRONICS	6.13	-0.31	-5.1									
OTC	11.25	3.88	MENTEL	6.00	-0.75	-12.5									
OTC	15.00	8.50	MICROAGE INC.	12.25	-0.38	-3.2									
OTC	15.00	8.50	MICROAGE INC.	12.25	-0.38	-3.2									
OTC	53.88	38.00	POLY MANAGEMENT SYS.	39.38	0.75	1.7									
OTC	33.50	25.25	REYNOLDS AND REYNOLDS	33.00	1.25	3.9									
OTC	24.25	16.75	SEI CORP. (H)	21.75	-2.50	-11.2									
OTC	14.25	7.50	13.00	-0.75	-5.5										
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75	SHL SYSTEMS	27.50	-0.06	-0.9									
OTC	31.25	16.75													

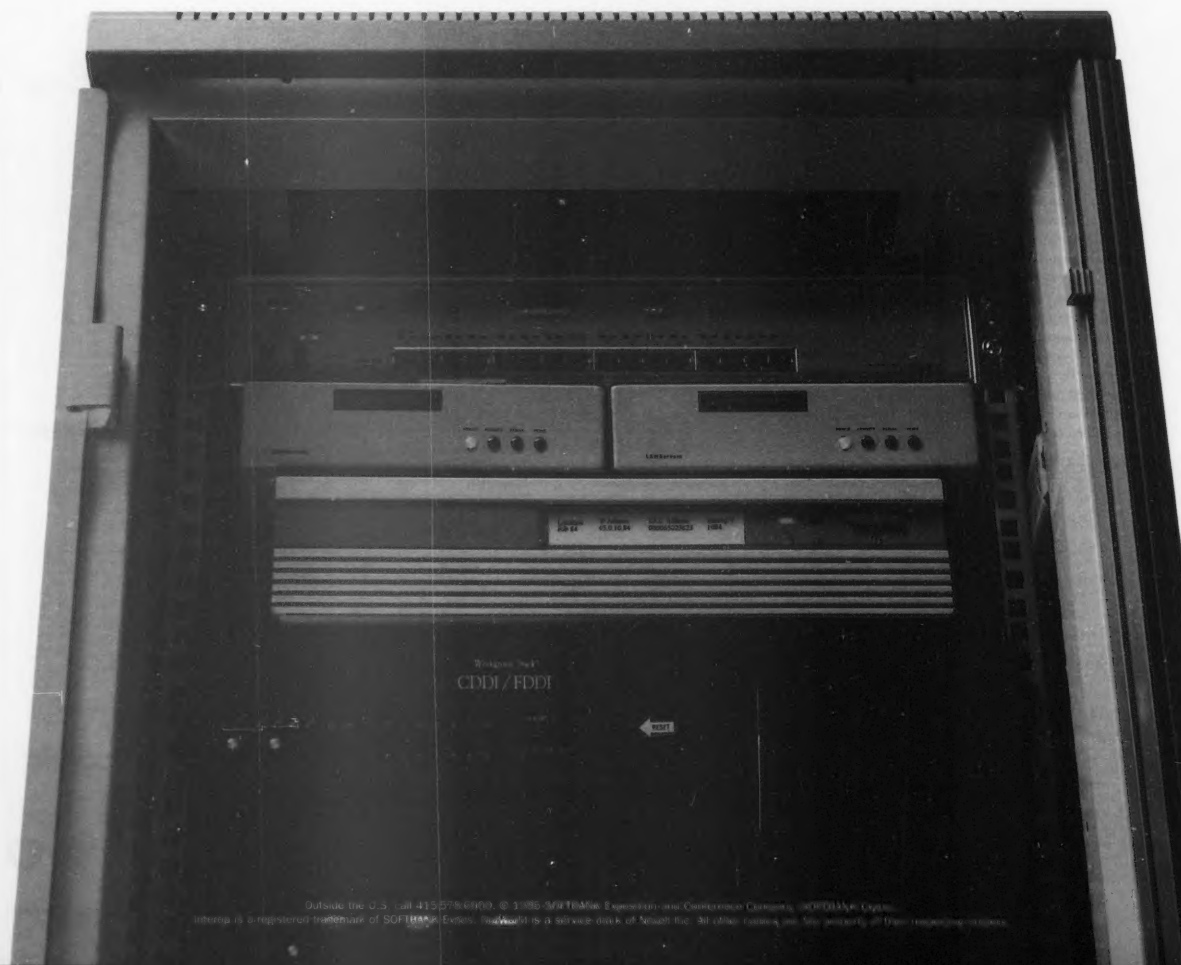
IF YOU'RE REALLY SERIOUS ABOUT NETWORKING, PLUG YOUR PRODUCTS IN HERE.

If your job is to sell the latest networking hardware or software, you're always looking for a good connection. Which is exactly what you get with the InteropNet™ at NetWorld+Interop®. A live, multivendor production network connecting exhibitors to each other, the Internet and the World Wide Web, the InteropNet lets you plug in your products and run real applications right on the show floor. So instead of watching some canned demo, people

can see first-hand exactly how your product works. Hey, they even get to try it out for themselves. The InteropNet is just one way for networking pros to interactively learn about the latest networking solutions at N+I. In fact, it's that hands-on learning that keeps them coming back. Why not see for yourself? Give us a call right now for more information on exhibiting at NetWorld+Interop 95 Atlanta. And plug yourself into the networking summit.

NETWORLD+INTEROP

Conference: Sept. 25-29, 1995 • Exhibition: Sept. 27-29, 1995 • Atlanta, Georgia
For more information, call 800-488-2883 • Or access the web at <http://www.interop.com>



Outside the U.S. call 415-276-0000. © 1995 S/W TRM. InteropNet and InteropNet+ are trademarks of S/W TRM. NetWorld is a service mark of NetWorld Inc. All other names are the property of their respective owners.



Windows 95 arrives

"For [Starfish Software], we have an opportunity to surf a huge wave all the way to the beach. We have Microsoft to thank for creating this big wave of demand."

— Philippe Kahn, chairman of Starfish Software and founder of Borland International, Inc., both in Scotts Valley, Calif.



Philippe Kahn

"I'm totally sick of all the Windows 95 hype. This is beginning to make the O.J. trial look interesting." — Jeffrey Tarter, editor of the "Soft Letter" newsletter

"It is the most over-hyped product in the history of the industry. When people look back, they will see all hoopla created for an operating system. This is like spending \$200 million to promote the design of a new carburetor."

— Michael Mace, director of Macintosh platform marketing at Apple Computer, Inc.

"Think of it like the rollout of a new soda from Coke. [Windows 95 is] like New Coke — sort of flat."

— Chris Le Tocq, president of SoftTracks, a market research company in Los Altos, Calif.

"I don't have any comment on this. I'm on vacation."

— Mitch Kapur, founder of the Electronic Freedom Frontier and Lotus Development Corp.

Party is over

CONTINUED FROM COVER 1

Deloitte & Touche has already installed Windows 95 on 1,000 PCs, said Gary Tiesenga, manager of network services at the company's data center in Nashville. By Jan. 1, Tiesenga said, he aims to have another 5,000 to 6,000 machines migrated. He hopes to move the entire firm of 16,500 users over by the end of next year.

"People keep asking us how soon they can have it," Tiesenga said. Deloitte is taking a highly planned, careful approach, complete with training classes that will begin next month. But other than buying new 32-bit utilities, because many 16-bit utilities will not work with Windows 95, the company will not move to 32-bit applications until at least next June, he added [CW, Aug. 21].

One company on Microsoft's list may be there by mistake.

A spokeswoman for Siemens Corp. said that while the company has indeed signed a purchase agreement for Win-

dows 95, "there is no immediate decision to implement it."

The current plan is to "wait for the next release," the spokeswoman said. But because Siemens has 30 different highly decentralized operating companies in the U.S., "you may have somebody out there that's said 'sure' [to early deployment]," she said. Additionally, "there is no such company as Siemens, Inc.," which is how the company appears on Microsoft's list, she added.

Also on the shelves

Beside the cavalcade of new applications from third-party developers shipping last week, Microsoft also announced immediate retail availability of Office 95 and Plus Pack, which features several advanced utilities and Microsoft's Internet Explorer.

The launch marks the first time a significant number of new applications that use the system's features shipped simultaneously with the system. Indeed, applications that took specific advantage of Windows 3.0 and 3.1 lagged months behind both of those systems' release.

"This is the first operating system

where, well in advance of the product shipping, [independent software vendor] investment shifted over to developing for the new product instead of the old one," Gates said. Of course, Windows 95 was at least eight months late in shipping, so some cynics might say the developers had extra time.

Regardless, because Office dominates the applications productivity suite category with more than 80% market share and the individual Microsoft applications dominate the major applications categories, Microsoft is well positioned to feed users' hunger for products to run under Windows 95.

Microsoft also officially opened the

doors to its The Microsoft Network online service Thursday.

Microsoft hypes Windows 95 around the world. See page 43.

Windows 95 trivia

- ▶ Number of new products at launch — 300
- ▶ Size of advertising budget — about \$200 million
- ▶ Number of new products at launch — 300
- ▶ Number of retail outlets — 20,000
- ▶ Number of beta testers — 50,000
- ▶ Number of years worked on — 4
- ▶ Number of OEMs bundling it in — about 280
- ▶ Number of companies showing new products — 125
- ▶ Number of Windows 95 preview participants — 1 million
- ▶ Number of lines of code — 11 million
- ▶ Number of diskettes — 13
- ▶ Number of person-years to develop — 293
- ▶ Number of months officially late — About 8
- ▶ Number of cups of coffee consumed — 2.3 million (this is Seattle, after all)

Source: Microsoft Corp.

Microsoft bullied show organizers

IBM exec's keynote on and off again

Microsoft Corp. appears to be using a variety of strong-arm tactics to keep everyone from computer retailers to help desk personnel to trade show organizers in line.

Two weeks ago, IBM accused Microsoft of threatening to pull its sponsorship of the Windows Solutions Conference & Exposition in September and rescind its permission to use the name "Windows" in the conference title if Lee Reiswig, IBM's top OS/2 executive, was allowed to deliver the show's final keynote speech.

IBM eventually bowed out of the show.

In an interview with *Computerworld* [CW, Aug. 21], Cameron Myhrvold, director of marketing at Microsoft's Developer Division, vehemently denied these charges.

Then last week in a follow-up report by the New York Times News Service, Myhrvold reported that he did in fact ask Softbank Exposition and Conference Co., the show's organizer, to cancel Reiswig's appearance. Myhrvold also said that just days later he changed his mind and decided that Reiswig could speak as planned.

Commenting on the report, Kira Sorenson, a spokesperson for Microsoft's Developer Division, said, "It's an amazingly complex issue, and right now we are not going to refute the *Times* article." — Lisa Picarille

Pirates, products trail Win 95

Microsoft Corp. wasn't the only vendor with news surrounding the Windows 95 launch last week.

Pirated copies of Windows 95 have already turned up in the Netherlands and Hong Kong. Also circulating in the land of tulips are counterfeit copies, according to a Microsoft official.

French newspapers reported the existence of some 50,000 pirated copies, a number Microsoft said sounded high. In April, illegal copies of an English beta version of Windows 95 were being sold in Moscow's Radio Rynok, an open-air consumer goods flea market.

Microsoft held a meeting with the Business Software Alliance anti-piracy group last Monday to devise a strategy for tackling this problem.

Novell, Inc. announces NetWare Client 32 for Windows 95, client software that will let users running Windows 95 access NetWare

servers and use Novell's NetWare Directory Services (NDS). The new software will be offered free as part of a prerelease scheduled for next month.

The 32-bit client software will feature NetWare Application Launcher, a utility that will let network managers create application objects in NDS trees. This is said to speed administration and simplify user access to networked applications.

The leading PC software vendors showed their Windows 95 logo-compliant applications under tents at the circus-like launch. Among the largest software vendors showing 32-bit products was Adobe Systems, Inc. AutoDesk, Inc. demonstrated the benefits of 32-bit Windows 95 technology in its AutoCAD Release 13, including improved ease of use in opening

multiple sessions of object-oriented drafting designs.

In the communications suite category, Delrina was showing CommSuite 95, three communications products including WinFax

Pro 7.0, Cyberjack 7.0 for Internet access and WinComm Pro 7.0. Perhaps the most interesting new Windows 95 feature was the computer telephony integration in WinFax 7.0, which enables users to manage voice message, faxes, e-mail and pager messages in the 32-bit version.

IBM, one of the very last holdouts against signing a Windows 95 license agreement, finally caved in last week. IBM said it will bundle copies of Win 95 on its PCs, but not for another three weeks or so, which is the time it will take IBM to install the software on its PCs.

Compiled by CW staff.



The Back Page

Cobol programmers get help shifting to object orientation

No matter how much you want to get started, there's a barrier to plunging into object-oriented systems. The existing applications on which your business depends are not object-oriented, and neither are most, if any, of your programmers.

Nine times out of 10, those programs are Cobol — there's an estimated 80 billion lines of Cobol still in use today — and Cobol is an anathema to those in the know on object-oriented development. The Cobol programmer is trained to break a program into procedure and data divisions, while the object cognoscenti say the whole purpose of an object is to combine data with methods, or procedures.

So it's common to hear at symposiums that many of the world's 600,000 Cobol programmers can't make the transition to object-oriented development. These pronouncements stem from a sense of exclusivity and high priesthood on the part of the speakers. However, Raymond Obin, a developer at Micro Focus Ltd. in England, convincingly

shows there is no reason why object-oriented concepts can't be captured in languages such as Cobol as well as Smalltalk or C++.

In his book, *Object Orientation, An Introduction for Cobol Programmers*,

Obin illustrates that many object-oriented concepts can be expressed in Cobol 85 without any modifications. And he explains object Cobol in terms familiar to today's Cobol programmers.

Both Micro Focus and IBM have versions of object-oriented Cobol. IBM's is still in beta testing, but Micro Focus' has been available for OS/2 and Microsoft's Windows NT for more than a year. These products offer a direct bridge between legacy systems and future object systems, and many Cobol

programmers can help span the gap.

Of the two, IBM's object Cobol offers the leanest version over Cobol 85, with about nine object-oriented extensions, according to Carrie Woerner, manager of application development and technical marketing at IBM's Santa Theresa Lab in San Jose, Calif. No date has been an-

nounced yet for general availability.

Micro Focus offers a more extensive version in Visual Object Cobol, which runs on Windows NT and will be available in a Windows 95 version by Oct. 1.

Both Micro Focus' and IBM's object Cobol are dynamic bind languages. This means changes can be made to the source code, and they will be automatically compiled into the production system in its next run.

Micro Focus' Visual Object Cobol supports single inheritance as does the Smalltalk language.

IBM's object Cobol supports both single and multiple inheritance like C++, Woerner says. Micro Focus development spokesman Keith Howard says Micro Focus will consider supporting multiple inheritance in the future.

While Micro Focus' version supports integration of Visual Basic custom controls and OLE objects, IBM's Cobol will set System Object Model (SOM) bindings for direct-to-SOM implementations. "We try to hide the SOM technology from the programmer," Woerner says. SOM is IBM's language-neutral model for handling messages between objects written in different languages and those running on different platforms.

Beyond the technical features of both systems, however, are more practical considerations. Cobol is not isolated as an object language. Object Cobol programs can inherit from an existing C++

class. Or existing, procedural Cobol transaction programs and databases can be recast as objects in a Cobol object system.

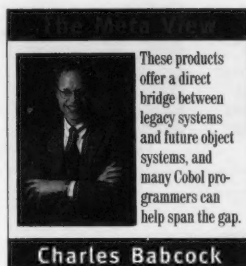
The much-criticized Cobol could continue to serve as a readable business language in an object-dominated future. Even if it does, however, there's still the question of how many

Cobol programmers will make the transition and adopt the mind-set needed to program in object Cobol.

"In our experience, 30% to 40% don't make the shift," says Patricia Gill, the new head of Hewlett-Packard's Object Oriented Solution Center in Palo Alto, Calif. But that means as many as 60% to 70% have the potential to complete the transition.

With the emerging object Cobols, these programmers represent a resource that will move legacy systems forward.

Babcock is *Computerworld's* technical editor. His Internet address is charles_babcock@cw.com.



Charles Babcock

Inside Lines

Opening up to Windows NT

Hewlett-Packard is gearing up to announce full Windows NT support under its OpenView network management platform in about two months, according to Scott R. Safe, HP's marketing programs manager for OpenVision products and services. "The desktop is a key focus for the OpenView program," Safe said last week. "The market needs an integrated set of applications for managing the NT desktop and server." OpenView currently manages Windows desktops and can manage NT in a primitive fashion through a Simple Network Management Protocol agent.

Legato targets NetWare on the low end

Legato Systems this week is expected to announce new low-end backup software for Novell NetWare servers. Aimed at users with a single NetWare server and tape drive, the Legato Data Backup Utility will compete with Novell's SBACKUP and will be available next week. Pricing information was not available.

The one you love to hate

Microsoft may be trying to kiss up to the distributed computing crowd, but it didn't have many fans at the Open Software Foundation's developers conference in Boston last week. At one session, the speaker asked how many people had managed to avoid using Windows. A handful of the roughly 200 folks in the room raised their hands and were greeted with applause from their Windows-experienced peers.

Climbing up the NDS tree

The Houston-based LAN Support Group earned praise among managers of Novell NetWare networks

for its ability to peek inside the bindery database on those servers. Now renamed BindView Development, the tool maker is preparing a version of its analysis and reporting software to help users manage the NetWare Directory Services (NDS) database and objects on the NDS tree with enterprise-wide NetWare 4.x. BindView for NDS should be available by the end of next month, offering baseline reports to track changes and problems, server profiles and security audits.

Crunch time for Convex

The next couple of quarters should go a long way toward answering the question of whether struggling Convex Computer has a long-term future, according to Wim Roelands, the head of computer operations at Convex partner/benefactor Hewlett-Packard. HP started reselling Convex's massively parallel systems early this year to help pull the company out of a sales slide but remains uncertain that enough business can be drummed up in time to keep Convex on its feet. "The jury's still out on that," Roelands said at an HP conference in Boston last Friday. He declined to say what HP would do if Convex collapses.

We're not worthy

The upcoming shipment of Hitachi Data Systems' big-kahuna Skyline mainframes is apparently prompting IBM to whisper some not-so-nice things about MVS in customers' ears. The IBM folks are saying MVS may not be cut out to run on Skyline because it hasn't been optimized for the new machine's processors, which are twice as powerful as standard ES/9000s. Why would IBM tread-mouth its Mother of All Mainframe Operating Systems? Because the computer giant is more worried about losing customers to Skyline, an analyst said. HDS started testing the first Skyline this month and is expected to ship its first box in November.

Fast and twisted

Hub vendor NetWorth is expected to announce this week what analysts say will be the first hub that supports 100Base-T "fast" Ethernet over Category 3 twisted-pair wire. "Grand Junction Network, Intel Corp. and others have talked about this, but NetWorth could be the first to deliver," said one source briefed on the announcement. In other news, CrossComm plans to announce several new switches this week.

Expanded Notes

Lotus has been trying to expand the reach of Notes by letting it exchange data with other databases. But so far it has done it with third-party developer support. Now the company plans to provide products that help users on Notes clients read an Oracle database and vice versa. The development is apparently under way at Edge Research in Portsmouth, N.H., a supplier of application development tools that Lotus acquired last September. Lotus last week declined to comment on the work.

Microsoft's much-vaunted on-line launch event fell flat on its cyberface last week. The Microsoft Network, making its debut as a real commercial service, had an icon on its MSN Today page indicating that if you clicked on it, it would take you to the launch event happening on Microsoft's Internet home page. But clicking on it did absolutely nothing. Somebody tell America Online CEO Steve Case to calm down. Maybe he doesn't have that much to worry about! But if some news tip is worrying you, by all means give us a call on our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.



AFTER HURRICANE ANDREW, THE PRESIDENT SENT IN THE TROOPS. WE SENT PETER NASCA.

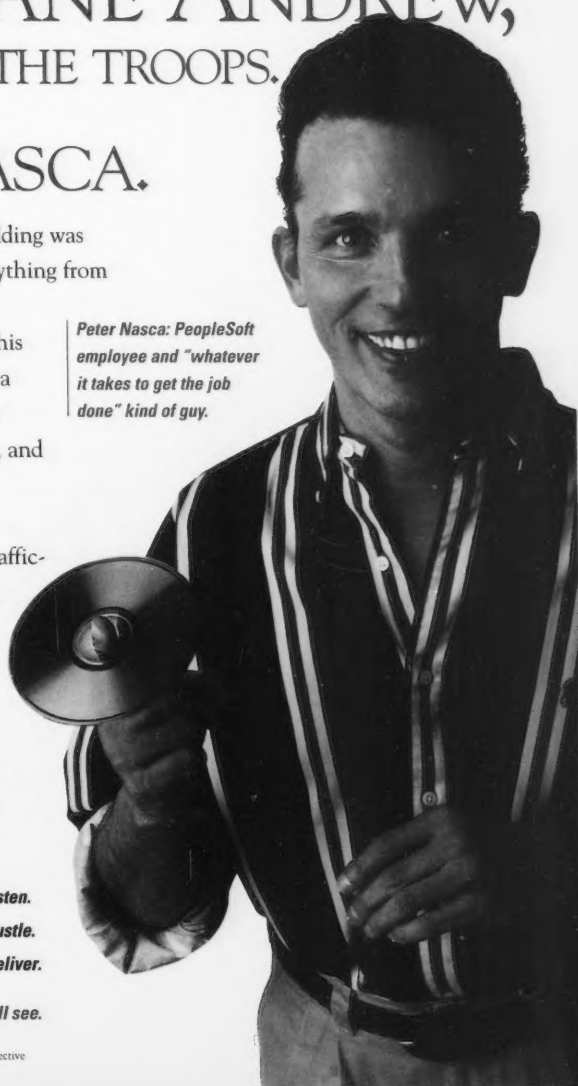
The customer's old headquarters lay in ruins. Their new building was still under construction. And the roads were jammed with everything from refugees to roofers' trucks.

That was the situation facing PeopleSoft's Peter Nasca and his software implementation team when they landed in Florida on a stormy August morning, just days after Hurricane Andrew. Our customer, ProSource, was spinning off from its parent company, and needed to be up and running with PeopleSoft by December 31. Come hell or high water.

Despite the rubble, despite spotty electric service, despite traffic-choked highways, Peter and his team successfully implemented the software. He even flew back to Miami on Christmas Day to ensure the system would be up and running, smoothly and on time. The result: another satisfied customer for PeopleSoft.

So if you're looking for client/server solutions from a company that knows no obstacles, call 800-947-7753 or e-mail us at info@peoplesoft.com. We'll come running—even if your business isn't located in a disaster area.

Peter Nasca: PeopleSoft employee and "whatever it takes to get the job done" kind of guy.



Enterprise-wide client/server business solutions for finance, distribution, manufacturing, and human resources.

PEOPLE
Soft

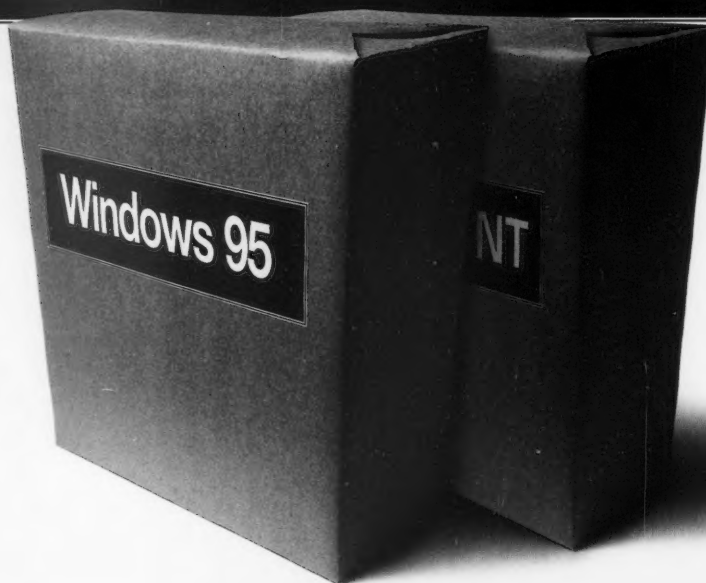
We listen.

We hustle.

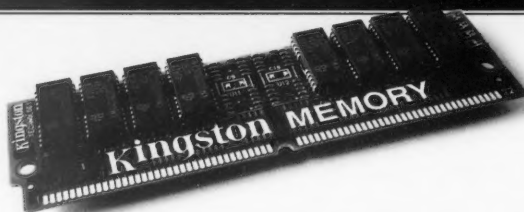
We deliver.

You'll see.

hinking Windows?



hink memory. hink Kingston.



Windows® NT. Windows 95. OS/2. All the hype about these powerful, new operating systems overlooks one tiny fact—most PCs and servers simply can't run them unless you add more memory. But Kingston can help you meet the demands of today's memory-hungry software, no matter what kind of systems you have.

You see, Kingston makes memory modules for more than 2,300 kinds of PCs, workstations, and printers. Not just all of the newest models from the leading brands, we make memory for all of the

older systems too. Plus, we're the only ones who actually test 100% of our memory. And all of it comes with a lifetime guarantee.

How can you find the right memory configuration for your particular systems? That's easy. We make an electronic guide that helps find the exact memory you need in seconds. It's called the KEPLER configuration guide and it comes on a convenient, new Windows CD. You can get it free by calling (800) 251-9059. Or download it from our BBS by calling (714) 435-2636 or from CompuServe by typing GO KINGSTON.



Kingston
TECHNOLOGY CORPORATION

For information on our memory products, call (800) 251-9059.

Kingston Technology Corporation, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699.
© 1995 Kingston Technology Corporation. Kingston Technology is a registered trademark of Kingston Technology Corporation. All rights reserved. Windows is a registered trademark of Microsoft in the U.S. and other countries. All other products or services are the trademarks or registered trademarks of their respective holders.

